Personal Copy
for
JACK BEACHAM
City Engineer
Athens, Georgia.

SPECIFICATIONS

FOR

The Construction of Low Rent Housing Project

GA. 3-3

ATHENS. GEORGIA

FOR

The Housing Authority of the City of Athens, Georgia

NO. 1 PARKVIEW HOMES

ATHENS. GEORGIA

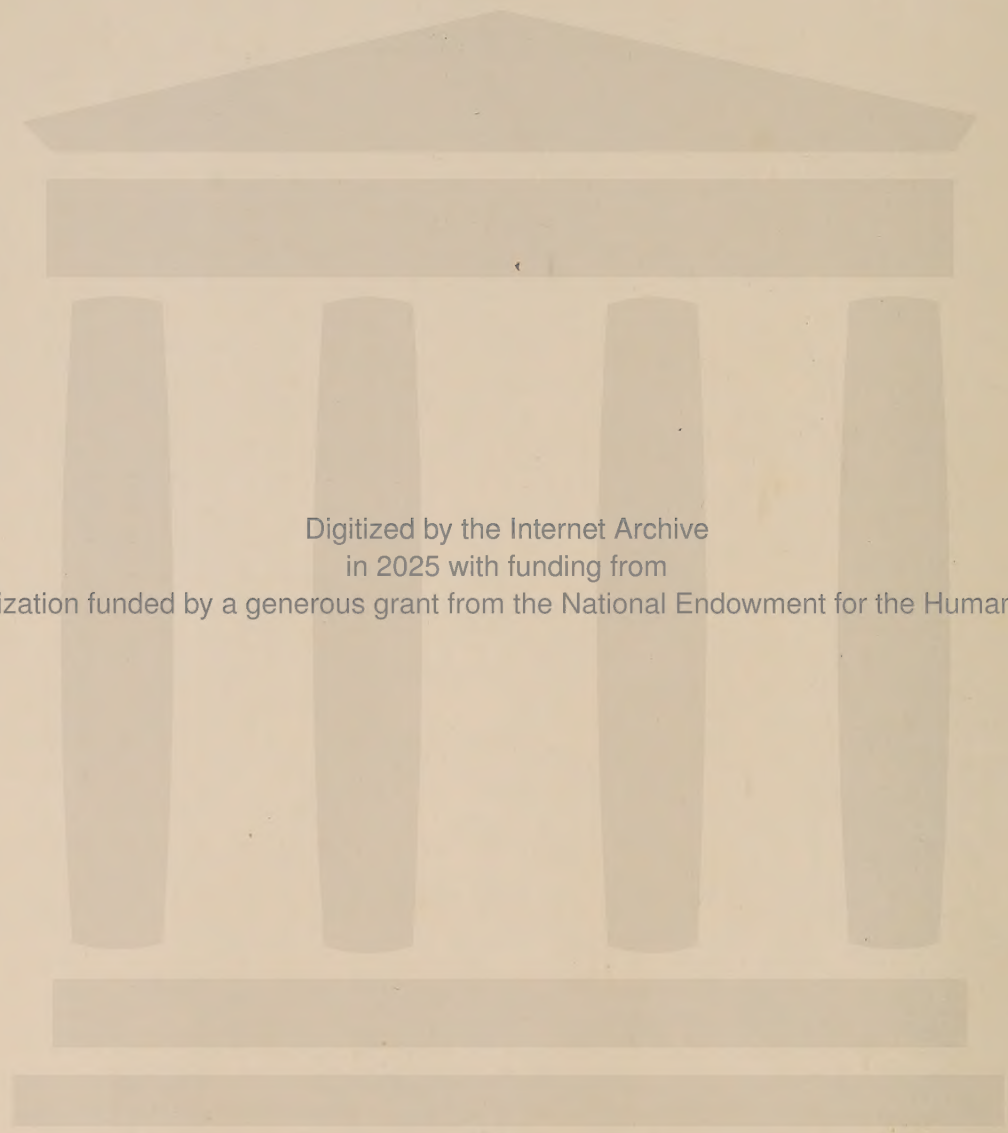
ASSISTED BY THE

Housing and Home Finance Agency

PUBLIC HOUSING ADMINISTRATION

Set No. 2

KUHLKE & WADE • ARCHITECTS • AUGUSTA, GEORGIA



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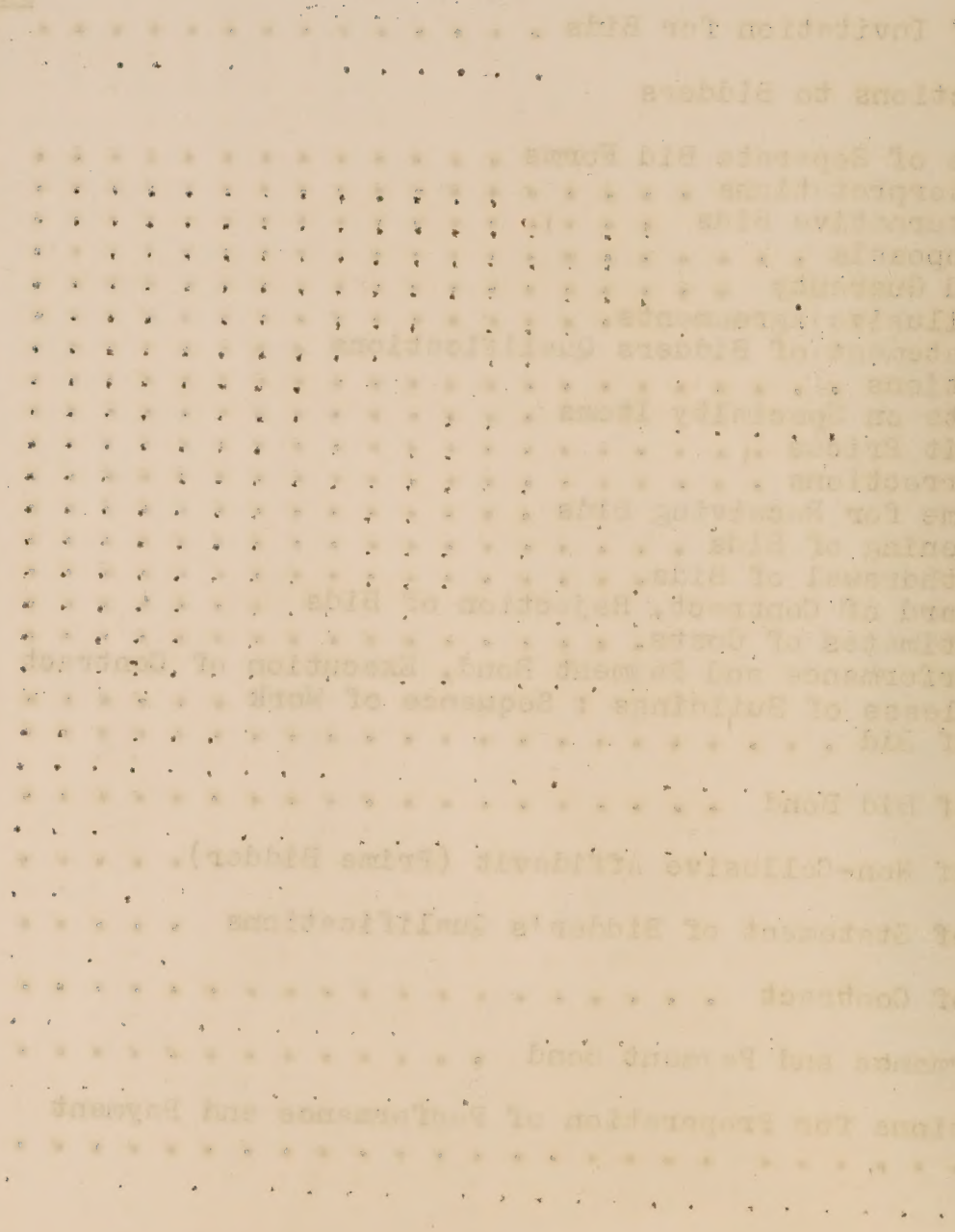

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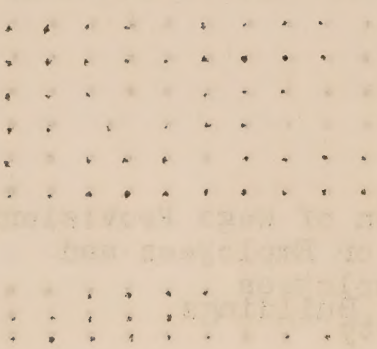

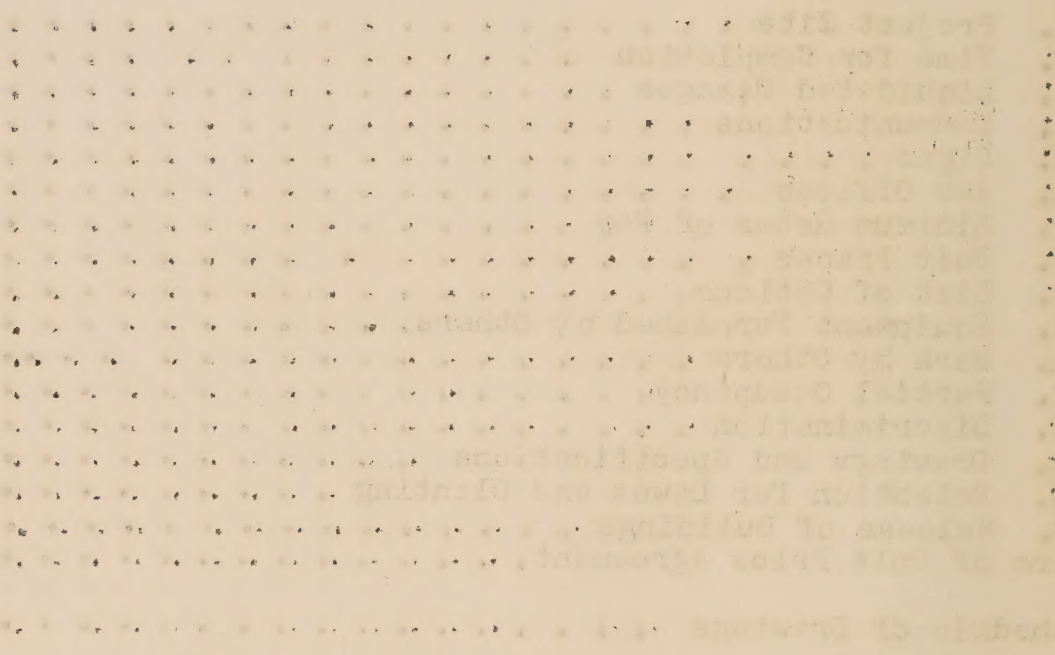

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FORM OF INVITATION FOR BIDS

ADVERTISEMENT FOR BIDS

The Housing Authority of the City of Athens, Georgia will receive bids for the furnishing of all labor, materials, equipment and services required to construct and complete Project Ga 3-3, a Low Rent Housing Project consisting of 130 Dwelling Units, a Maintenance and Administration Building and related site and other work until 2:00 P.M. E.S.T. on the _____ day of _____ 1957, at the Social Building located on drive through Parkview Homes Project, Broad Street, Athens, Georgia, at which time and place all bids will be publicly opened and read aloud.

Proposed forms of contract documents, including plans and specifications, are on file at the office of the Housing Authority of the City of Athens, Georgia, Parkview Homes, Broad Street, Athens, Georgia, at the office of Kuhlke and Wade, Architects, Augusta, Georgia, at the Atlanta Builders Exchange, Atlanta, Georgia, and at the F. W. Dodge Plan Room, Atlanta, Georgia.

Copies of the documents may be obtained by depositing $75.00 with Kuhlke and Wade, Architects, Augusta, Georgia, for each set of documents so obtained. Such deposit will be made payable to the Housing Authority of the City of Athens, Georgia, and will be refunded to each person who returns the plans, specifications and other documents in good condition within ten days after bid opening.

A certified check or bank draft, payable to the Housing Authority of the City of Athens, Georgia, U. S. Government Bonds, or a satisfactory bid bond executed by the Bidder and acceptable sureties in an amount equal to five percent of the bid shall be submitted with each bid.

The successful bidder will be required to furnish and pay for satisfactory performance and payment bond or bonds in an amount equal to 100 per cent of the Contract Sum.

Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Specifications must be paid on this project.

FORM OF INVITATION FOR BIDS

The Housing Authority of the City of Athens, Georgia reserves the right to reject any or all bids or to waive any informalities in the bidding.

No bid shall be withdrawn for a period of thirty (30) days subsequent to the opening of bids without the consent of the Housing Authority of the City of Athens, Georgia.

THE HOUSING AUTHORITY OF THE CITY OF ATHENS, GEORGIA.

By: Joel A. Wier

Title - Executive Director

Date _____ 1957

INSTRUCTIONS TO BIDDERS

1. USE OF SEPARATE BID FORMS

Attention is directed to the fact that these Specifications include a complete set of bidding and contract forms. These are for the convenience of bidders and are not to be detached from the Specifications, or filled out, or executed. Separate copies of Bid Forms are furnished for that purpose, in quadruplicate, three to be submitted with the bid and one to be retained by the bidder for his records. Only one of the three copies of the bid shall be signed. The other two shall be conformed copies only.

2. INTERPRETATIONS

No oral interpretation will be made to any bidder as to the meaning of the Specifications including the Drawings. Every request for such an interpretation shall be made in writing to the Local Authority, addressed to Mr. Joel A. Wier, Executive Director, Housing Authority of the City of Athens, Georgia, No. 1 Parkview Homes, Athens, Georgia. Any inquiry received ten or more days prior to the date fixed for opening of bids will be given consideration. Every interpretation made to a bidder will be in the form of an addendum to the specifications which, if issued, will be on file in the office of the Local Authority and the office of the architect at least seven days before bids are opened. In addition, addenda will be mailed to each bidder, but it shall be the bidders responsibility to make inquiry as to addenda issued. All such addenda shall become part of the Contract and all bidders shall be bound by such addenda, whether or not received by the bidders.

3. ALTERNATIVE BIDS

Alternative bids will not be considered.

4. PROPOSALS

a. All bids must be submitted on forms prepared by the Local Authority and shall be subject to all requirements of the Specifications, including the Drawings, and this Instructions to Bidders. Only the original shall be signed. Two additional conformed copies shall be submitted.

b. Bid Documents shall be enclosed in envelopes (outer and inner), both of which shall be sealed and clearly labeled with the words "Bid Documents", the project number, name of bidder, and date and time of opening, so as to guard against premature opening of any bid.

c. A second inner sealed envelope marked "Data on Specialty Items" containing the information required by Section 9 below shall be enclosed in the outer envelope.

d. The Local Authority may consider as informal any bid on which there is an alteration of or departure from the Bid Form hereto attached.

e. The Contract will be based upon the completion of the work according to the Specifications (including the Drawings), together with all Addenda thereto, under the lowest proposal submitted by a responsible bidder, irrespective of the options permitted by the Contract which the bidder chooses to use. The Local Authority has determined, by its inclusion of the options, that any of the requested options are equally acceptable. The bidder is, therefore, required to submit only his lowest proposal for the work to be performed inasmuch as no other will be considered.

5. BID GUARANTY

a. The bid must be accompanied by a bid guaranty which shall not be less than five percent (5%) of the amount of the bid, and at the option of the bidder may be a certified check, bank draft, U. S. Government Bonds (at par value), or a bid bond secured by a guarantee company or a surety company in the form attached. No bid will be considered unless it is so guaranteed. Certified check or bank draft must be made payable to the order of The Housing Authority of the City of Athens, Georgia. Cash deposits will not be accepted. The bid guaranty shall insure the execution of the contract and the furnishing of performance and payment bond or bonds by the successful bidder all as required by the Specifications.

b. Revised Bids, whether forwarded by mail or telegram, if representing an increase in excess of two percent (2%) of the original bid, must have the bid guaranty adjusted accordingly; otherwise the revision of the bid will not be considered and the original bid shall remain in force.

c. In case Bid Guaranty is in the form of a certified check, bank draft, or U. S. Government Bonds, the Local Authority may make such disposition of the same as will accomplish the purpose for which submitted. Certified checks or bank drafts, or the amount thereof, and U. S. Government Bonds of unsuccessful bidders will be returned as soon as practicable after the opening of Bids.

6. COLLUSIVE AGREEMENTS

a. Each person submitting to the Local Authority a bid for any portion of the work contemplated by the bidding documents shall execute an affidavit in the form herein provided, to the effect that he has not colluded with any other person, firm or corporation in regard to any bid submitted. Such affidavit shall be attached to the bid.

b. Each person submitting a low bid for any subcontract work shall submit to the Contractor an affidavit in the form provided in Section 4 of the General Conditions.

c. Failure on the part of any bidder for either the prime contract or subcontracts to observe these provisions shall be cause for rejection of his bid.

7. STATEMENT OF BIDDERS QUALIFICATIONS

Each bid and each conformed copy thereof must be accompanied by a statement, on the form furnished for that purpose, a copy of which is included in the specifications, of the bidder's financial resources, his construction experience, and his organization and equipment available for the work contemplated. The Local Authority shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish the Local Authority all such information and data for this purpose as the Local Authority may request. The right is reserved to reject any bid where an investigation of the available evidence or information does not satisfy the Local Authority that the bidder is qualified to carry out properly the terms of the Specifications.

8. OPTIONS

The attention of all bidders, whether prime or subcontract, is directed to the "List of Options" contained in the Special Conditions.

9. DATA ON SPECIALTY ITEMS

a. Each general bidder who included in his bid the costs of the mechanical branches of the contract work shall submit, with his bid, in a separate sealed envelope identified on the outside by his name, project number, and marked "Data on Specialty Items", a breakdown of his overall bid showing the amounts included therein for the following subcontracts and work.

DWELLINGS

Structures, shelving and cabinets	$
Plumbing, piping and fixtures	$
Space Heaters	$
Electric Wiring and fixtures	$

NON DWELLING

Structures, shelving and cabinets	$
Plumbing, piping and fixtures	$
Heating	$
Electric wiring and fixtures	$

SITE IMPROVEMENTS

Demolition	$
Rough Grading	$
Paving; Roads, Walks, on-site	$
Riprapping	$
Fences and Guard Rails	$
Retaining Walls including Pipe Rails	$
Clothes poles	$
Garbage Containers	$
Sanitary Sewers	$
Water lines	$
Lawns and Planting	$
TOTAL CONTRACT AMOUNT	$

b. This information is required for analytical purposes, shall have no bearing upon the determination of the lowest responsible bidder, and will not be divulged to the public at bid opening.

10. UNIT PRICES

a. Subsequent to bid opening, and prior to and as a condition of award, the successful bidder shall negotiate with the Local Authority and agree upon mutually acceptable unit prices for the items listed in Section 8 of the Special Conditions, and conforming to the terms thereof.

b. No unit prices will be quoted in or submitted with any bid.

11. CORRECTIONS -

Erasures or other changes in the bids must be explained or noted over the signature of the bidder.

12. TIME FOR RECEIVING BILS

a. Bids received prior to the time of opening will be securely kept, unopened. The officer whose duty it is to open them will decide when the specified time has arrived, and no bid received thereafter will be considered; except that when a bid arrives by mail after the time fixed for opening, but before award is made, and it is shown to the satisfaction of the officer authorized to make the award that the non-arrival on time was due solely to delay in the mails for which the bidder was not responsible, such bid will be received and considered. No responsibility will attach to an officer for the premature opening of a bid not properly addressed and identified. Unless specifically authorized, telegraphic bids will not be considered, but modification by telegraph of bids already submitted will be considered if received prior to the hour set for opening; Provided, that written confirmation of such modification over the signature of the bidder is placed in the mail and postmarked prior to the time set for bid opening.

b. Bidders are cautioned that, while telegraphic modifications of bids may be received as provided above, such modifications, if not explicit and if in any sense subject to misinterpretation, shall make the bid so modified or amended subject to rejection.

c. Bidders are cautioned to allow ample time for transmittal of bids by mail or otherwise. Bidders should secure correct information relative to the probable time of arrival and distribution of mail at the place where bids are to be opened; and, so far as practicable, make due allowance for possible delays in order to avoid the necessity for investigations of claims that such delays in receipt of bids were due solely to delay in the mails as provided in this section.

13. OPENING OF BIDS

At the time and place fixed for the opening of bids, every bid received within the time fixed for receiving bids will be opened and publicly read aloud, irrespective of any irregularities therein. Bidders and other persons properly interested may be present, in person or by representative.

14. WITHDRAWAL OF BIDS

Bids may be withdrawn on written or telegraphic request dispatched by the Bidder in time for delivery in the normal course of business prior to the time fixed for opening; Provided, that written confirmation of any telegraphic withdrawal over the signature of the bidder is placed in the mail and post marked prior to the time set for bid opening. Negligence on the part of the bidder in preparing his bid confers no right of withdrawal or modification of his bid after such bid has been opened.

15. AWARD OF CONTRACT; REJECTION OF BIDS

a. The Contract will be awarded to the responsible bidder submitting the lowest proposal complying with the conditions of the Invitation for Bids, provided his bid is reasonable and it is to the interest of the Local Authority to accept it. The bidder to whom the award is made will be notified at the earliest practicable date. The Local Authority, however, reserves the right to reject any and all bids and to waive any informality in bids received whenever such rejection or waiver is in the interest of the Local Authority.

b. The Local Authority also reserves the right to reject the bid of any bidder who has previously failed to perform properly, or to complete on time, contracts of a similar nature; who is not in a position to perform the contract; or who has habitually and without just cause neglected the payment of bills or otherwise disregarded his obligations to subcontractors, material men or employees. In determining the lowest responsible bidder the following elements, in addition to those above mentioned, will be considered; whether the bidder involved (1) maintains a permanent place of business; (2) has adequate plant equipment available to do the work properly and expeditiously; (3) has suitable financial resources to meet the obligations incident to the work; (4) has appropriate technical experience. The Local Authority reserves the right to consider as unqualified to perform the work of general construction any bidder who does not habitually perform with his own forces the branches of structural concrete, masonry, and carpentry.

c. The ability of a bidder to obtain a performance bond shall not be regarded as the sole test of such bidder's competency or responsibility.

16. ESTIMATES OF COSTS

The successful bidder may be required to cooperate with the Local Authority and the Architect in a breakdown of his bid price in order to show the division of costs between dwelling facilities, non-dwelling facilities and site improvements.

17. PERFORMANCE AND PAYMENT BOND, EXECUTION OF CONTRACT

a. Subsequent to the award and within ten days after the prescribed forms are presented for signature, the successful bidder shall execute and deliver to the Local Authority a contract in the form included in the Specifications in such number of counterparts as the Local Authority may require. Separate contract forms, in lieu of those found in the Specifications, shall be used for the purpose.

b. Having satisfied all conditions of award as set forth elsewhere in these documents, the successful bidder shall, within the period specified in 17a. above, furnish a performance and payment bond in a penal sum of at least 100% of the amount of the contract as awarded, as security for the faithful performance of the contract, and for the payment of all persons, firms or corporations to whom the Contractor may become legally indebted for labor, materials, tools, equipment, or services, of any nature, employed or used by him in performing the work. Such bond shall be in the form of bond included in the Specifications and shall bear the same date as, or a date subsequent to the date of the contract.

c. In the event the amount of the bonds required exceed the underwriting limitations (not limit on any one risk) placed on the surety company by the Secretary of the Treasury of the United States of America (Treasury Form No. 356-Revised) for United States Government Contracts, the Contractor must furnish co-sureties which collectively have underwriting limitation approval on any one risk at least equal to the amount of the bonds required. On each such bond the rate of premium shall be stated, together with the total amount of the premium charged. A current power of attorney for the person who signs for any surety company shall be attached to each copy of the bond furnished.

d. The failure of the successful bidder to execute such contract and to supply the required bonds within ten days after the prescribed forms are presented for signature, or within such extended period as the Local Authority may grant based upon reasons determined adequate by the Local Authority shall constitute a default, and the Local Authority may either award the contract to the next responsible bidder or readvertise for bids, and may charge against the bidder the difference between the amount of the bid and the amount for which a contract for the work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the bid guaranty.

18. RELEASE OF BUILDINGS: SEQUENCE OF WORK.

Bidders are referred to the Special Conditions for information regarding the manner in which the existing buildings will be released and the site made available for demolition purposes, and the sequence in which the demolition work shall be performed.

FORM OF BID

BID FOR PROJECT GA 3-3

To The Housing Authority of the City of Athens, Georgia.
No. 1 Parkview Homes
Athens, Georgia.

Gentlemen:

1. The undersigned, having familiarized (himself)(themselves) with the local conditions affecting the cost of the work, and with the Specifications (including Invitation for Bids, Instructions to Bidders, this bid, the form of Bid Bond, the form of Non-Collusive Affidavit, the form of Statement of Bidder's Qualifications, the form of Contract, and the form of Performance and Payment Bond, the General Conditions, the Special Conditions, the General Scope of Work, the Technical Specifications and the Drawings) and Addenda, if any thereto, as prepared by Kuhlke and Wade, Architects, Augusta, Georgia and on file in the office of The Housing Authority of the City of Athens, Georgia, hereby proposes to furnish all labor, materials, equipment and services required to construct and complete Low Rent Housing Project Ga. 3-3, Athens, Georgia, all in accordance therewith, for the sum of

_____

_____Dollars ($_____)

2. In submitting this bid it is understood that the right is reserved by the Housing Authority of the City of Athens, Georgia to reject any and all bids. If written notice of the acceptance of this bid is mailed, telegraphed or delivered to the undersigned within thirty (30) days after the opening thereof, or at any time thereafter before this bid is withdrawn, the undersigned agrees to execute and deliver a contract in the prescribed form and furnish the required bond within ten (10) days after the contract is presented to him for signature.

3. Security in the sum of _____Dollars ($_____) in the form of _____, is submitted herewith in accordance with the Specifications.

4. Attached hereto is an affidavit in proof that the undersigned has not entered into any collusion with any person in respect to this proposal or any other proposal or the submitting of proposals for the contract for which this proposal is submitted. Also attached is a statement of Bidders Qualifications.

FORM OF BID

Date_____,19____ _____
(Name of Bidder)

Official Address:

_____ By_____

_____ Title_____

(SIGN ORIGINAL ONLY)

FORM OF BID BOND

BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we the undersigned,

_____(name of Principal)_____

as PRINCIPAL, and

_____, (name of Surety) _____, as SURETY

are held and firmly bound unto The Housing Authority of The City of Athens, Georgia, hereinafter called the "Local Authority", in the penal sum of _____

_____Dollars, lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying bid, dated _____,19___ for the construction of Project Ga. 3-3, a Low-Rent Housing Project consisting of thirty dwelling buildings containing 130 dwelling units, one Maintenance and Management Building, and related site improvements. NOW, THEREFORE, if the Principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within sixty (60) days after the said opening, and shall within the period specified therefor, or, if no period be specified within ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the Local Authority in accordance with the bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract; or in the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bond within the time specified, if the Principal shall pay the Local Authority the difference between the amount specified in said bid and the amount for which the Local Authority may procure the required work or supplies or both, if the latter amount be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this _____ day of _____ 19____, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

FORM OF BID BOND

In presence of:

_____ (Individual Principal) (SEAL)

_____ (Business address)

_____ (Individual Principal) (SEAL)

_____ (Business address)

Attest:

_____ (Corporate Principal)

(Business address)

By_____ Affix Corporate Seal

_____ _____

Attest:

_____ (Corporate Surety)

_____

By_____ Affix Corporate Seal

_____ _____

(Power-of-attorney for person signing for surety company must be attached to bond.)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I,_____, certify that I am the _____

_____Secretary of the corporation named as Principal in the within bond; that _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his signature, and his signature thereto is geniune; and that said bond was duly signed, sealed, and attested to for and in behalf of said corporation by authority of its governing body.

_____(Corporate) (Seal)

FORM OF NON-COLLUSIVE AFFIDAVIT

A F F I D A V I T

(Prime Bidder)

State of _____)
)ss.
County of _____)

_____, being first duly sworn, deposes and says:

That he is (a partner or officer of the firm of, etc.) _____ the party making the foregoing proposal or bid, that such proposal or bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Housing Authority of the City of Athens, Georgia, or any person interested in the proposed contract; and that all statements in said proposal or bid are true.

_____

Signature of:
Bidder, if the bidder is an individual;

Partner, if the bidder is a partnership;

Officer, if the bidder is a corporation.

_____

Subscribed and sworn to before me
this _____day of _____, 19____.

_____

My commission expires _____19__.

FORM OF STATEMENT OF BIDDER'S QUALIFICATIONS

STATEMENT OF BIDDER'S QUALIFICATIONS
(General Contractor)

All questions must be answered and the date given must be clear and comprehensive. This statement must be notarized. If necessary add separate sheets for items marked *.

1. Name of bidder.
2. Permanent main office address.
3. When organized.

4. Where incorporated.

5. How many years have you been engaged in the contracting business under your present firm name?
6.* Contracts on hand; (Schedule these, showing gross amount of each contract and the approximate anticipated dates of completion.)
7.* General character of work performed by your company.
8. Have you ever failed to complete any work awarded to you? If so, where and why?
9.* Have you ever defaulted on a contract? If so, where and why?
10.*List the more important structures recently erected by your company, stating approximate cost for each and the month and year completed.
11.*List your major equipment available for this contract.
12.*Experience in construction work similar in importance to this project.
13* Background and experience of the principal members of your personnel, including the officers.
14.*Credit available, furnish written evidence.
15. Financial statement no more than 60 days old in the following form:

(_____Name_____)

BALANCE SHEET

AS OF _____

ASSETS

Current Assets:
Cash:
On hand $ -
In banks - $ -

Notes Receivable:			
Due within 90 days (Hypothecated $ -)	$ -		
Due after 90 days (Hypothecated $ -)	-		
Past Due (Hypothecated $ -)	-	$ -	
Less: Estimated uncollectibles	$ -		
Notes receivable discounted	-	-	-
Accounts Receivable:			
Completed contracts	$ -		
Deferred and unbilled contract costs	-		
Unfinished contract costs(contra)	-		
Other receivables	-	$ -	
Less: Estimated uncollectibles	-	-	
Deposits on Bids		-	
Raw Materials and Supplies (State basis)		-	
Other Current Assets		-	
Total Current Assets			$ -
Investments:			
Stocks and Bonds (Market Value $-)		$ -	
Other		-	
Total Investments			-
Fixed Assets:			
Land		$ -	
Buildings (Depreciated Value)		-	
Machinery and Equipment (Depreciated Value)		-	
Furniture and Fixtures (Depreciated Value)		-	
Other		-	
Total Fixed Assets			-
Other Assets:			
Intangible Assets, Goodwill, Patents		$ -	
Deferred Charges and Prepaid Expenses		-	
Restricted Cash		-	
Total Other Assets			-
TOTAL ASSETS			$ -

LIABILITIES

Current Liabilities			
Notes Payable:			
To banks	$ -		
For machinery and equipment	-		
For merchandise and raw materials	-		
Other	-	$ -	

Accounts Payable:				
Not past due	$ -			
Past due	-	-		
Unfinished Sub-Contract Costs (contra)		-		
Accrued Expenses (Interest, wages, etc.)		-		
Advances from Stockholders, directors, and Others		-		
State and Federal Taxes		-		
Long-Term Debt (Due within one year)		-		
Estimated Liability for Damages, etc.(Indeterminate in amount but due within one year)		-		
Other Current Liabilities		-		
Total Current Liabilities			$ -	
Deferred Credits:				
Deferred Income - Uncompleted Contracts	$ -			
Unamortized Bond Premium	-			
Total Deferred Credits			$ -	
Funded Debt:				
Mortgage Payable (Date, interest, rate, monthly payments if applicable, etc.)	$ -			
Other	-			
Total Funded Debt			$ -	
TOTAL LIABILITIES				$ -
Capital and Surplus:				
Capital:				
Preferred Stock (Shares issued, par value, etc.)			$ -	
Common Stock (Shares issued, par value, etc.)			-	
Total Capital				$ -
Surplus:				
Capital Surplus			$ -	
Earned Surplus			-	
Total Surplus				$ -
TOTAL LIABILITIES, CAPITAL AND SURPLUS				$ -

FORM OF STATEMENT OF BIDDER'S QUALIFICATIONS

Footnotes (When applicable):

(1) Where assets have been pledged against any liabilities, that fact and the nature and amount of the assets pledged should be stated.
(2) Contingent liabilities, liability as guarantor on contracts or accounts of others, etc.
(3) Amount of preferred stock dividends in arrears.
(4) Amount of defaults in principal, interest or sinking fund provision of funded debt.
(5) Where the value of fixed assets includes appreciation, that fact and the amount of appreciation for each item should be stated.

16. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Housing Authority of the City of Athens, Georgia.

17. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by The Housing Authority of the City of Athens, Georgia in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at _____ this _____ day of _____, 19___

(name of Bidder)

By _____

Title _____

State of _____)
County of _____) ss.

_____ being duly sworn deposes and says that he is _____ of (name of organization) _____ and that the answers to the foregoing questions and all statements therein contained are true and correct.

Sworn to before me this _____ day of _____, 19___

_____
Notary Public

My commission expires _____

(Bidder may submit additional information if desires)

FORM OF CONTRACT

THIS AGREEMENT made this _____ day of _____, in the year Nineteen Hundred and _____ by and between _____ a corporation organized and existing under the laws of the State of _____ a partnership consisting of _____ or individual trading as _____ hereinafter called the 'Contractor', and The Housing Authority of The City of Athens, Georgia, a body politic and corporate created by The Housing Authorities Law of the State of Georgia, hereinafter called the "Local Authority",

WITNESSETH, That the Contractor and the Local Authority for the consideration stated herein mutually agree as follows:

ARTICLE 1. Statement of Work. The contractor shall furnish all labor, material, equipment and services and perform and complete all work required for the construction of Low Rent Housing Project Ga. 3-3, Athens, Georgia, consisting of thirty (30) dwelling buildings containing 130 dwelling units, one (1) Maintenance and Management Building, and other improvements _____ in strict accordance with the "SPECIFICATIONS FOR THE CONSTRUCTION OF A LOW RENT HOUSING PROJECT GA 3-3, ATHENS, GEORGIA, FOR THE HOUSING AUTHORITY OF THE CITY OF ATHENS, GEORGIA, NO. 1 PARKVIEW HOMES, ATHENS, GEORGIA, ASSISTED BY THE HOUSING AND HOME FINANCE AGENCY, PUBLIC HOUSING ADMINISTRATION, KUHLKE AND WADE, ARCHITECTS, AUGUSTA, GEORGIA." and the Addenda thereto numbered _____ and _____ dated _____ and _____, dated _____, 1957, and the Drawings referred to therein, all as prepared by Kuhlke and Wade, Architects, Augusta, Georgia, which said Specifications, Addenda, and Drawings are incorporated herein by reference and made a part hereof.

ARTICLE 2. The Contract Price. The Local Authority shall pay the Contractor for the performance of the Contract, in current funds, subject to additions and deductions as provided in the Specifications, the sum of _____ Dollars ($_____).

ARTICLE 3. Contract Documents. The Contract shall consist of the following component parts:

a. This Instrument
b. General Conditions
c. Special Conditions
d. Technical Specifications
e. Drawings

This Instrument, together with the other documents enumerated in this Article 3, which said other documents are as fully a part of the Contract as if hereto attached or herein repeated, form the Contract. In the event that any provision in any component part of this Contract conflicts with any provision of any other component part, the provision of the component part first enumerated in this Article 3 shall govern, except as otherwise specifically stated. The various provisions in Addenda shall be construed in the order of preference of the component part of the Contract which each modifies.

IN WITNESS WHEREOF, the parties hereto have caused This Instrument to be executed in four (4) original counterparts as of the day and year first above written.

Attest:

_____

_____

_____ (Contractor)

By _____

Title _____

Business Address:

_____ (Street)

_____ (City)

_____

_____

The Housing Authority of the City of Athens, Georgia

By _____

Title Chairman

Business Address:

No. 1 Parkview Homes, Broad St.

Athens, Georgia

(Print or type the names underneath all signatures)

Certifications

I, _____, certify that I am the _____ of the corporation named as Contractor herein; that _____ who signed this Contract on behalf of the Contractor, was then _____ of said corporation; that said Contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

_____
:Corporate:
_____: Seal :_____

_____

I HEREBY CERTIFY that, to the best of my knowledge and belief, based upon observation and inquiry, _____, who signed this Contract for the _____, had authority to execute the same, and is the individual who signs similar contracts on behalf of this corporation with the public generally.

_____

(This last certification must be made by the person who signed the Contract for the Local Authority)

(Print or type the names underneath all signatures)

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____, hereinafter called the Principal, and _____ as Surety are held and firmly bound unto The Housing Authority of the City of Athens, Georgia, a body politic and corporate existing under the laws of the State of Georgia, its successors and assigns, for the use of said obligee and all persons doing work or furnishing services, equipment, supplies, labor and materials, under or for the purpose of the contract hereinafter referred to in the full and just sum of _____ _____DOLLARS ($_____) in lawful money of the United States of America to be paid to The Housing Authority of the City of Athens, Georgia, its successors and assigns to which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors and assigns jointly and severally firmly by these presents.

WHEREAS, the above bounded Principal has entered into a contract with the Housing Authority of the City of Athens, Georgia, bearing date of _____1957, for the furnishing of all services, equipment, supplies, labor and materials required or necessary for or incidental to the construction of the Low Rent Housing Project Ga. 3-3, Athens, Georgia, for the Housing Authority of the City of Athens, Georgia in accordance with Advertisement, bid documents, instructions to bidders, general conditions, plans and specifications and addenda thereto, and other documents set forth in the specifications prepared by Kuhlke and Wade, Architects, Augusta, Georgia, including certain terms and conditions in the aforesaid contract more particularly mentioned; and

WHEREAS, it was one of the conditions of the award by The Housing Authority of the City of Athens, Georgia, pursuant to which said contract was entered into, that these presents shall be executed;

NOW, THEREFORE, the conditions of this obligation are such that if the above bounded Principal shall in all respects fully comply with the terms and conditions of the aforesaid contract and his (or its) obligations thereunder including the advertisement, bid form, instructions to bidders, general conditions, plans, specifications, and other documents therein referred to and made a part thereof, and such alterations as may be made on said plans and specifications as therein provided for, and shall indemnify and save harmless The Housing Authority of the City of Athens, Georgia against or from all costs, expenses, damages, injury or loss which The Housing Authority of the City of Athens, Georgia,

may be subjected to by reason of any wrong doing, misconduct, want of care or skill, negligence or default including patent infringement on the part of said Principal, his (or its) agents, subcontractors or their (or its) employees, in the execution or performance of the aforesaid contract, and shall promptly pay all just claims for damages or injury to property and for all work done or skill, tools, machinery, supplies, services, labor, and materials furnished and debts and obligations incurred by said Principal in or about the construction or improvement contracted for, then this obligation to be void; otherwise to remain in full force and virtue.

And the said Surety to this bond, for value received, hereby stipulates and agrees that no change of the nature or terms, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder of the plans and specifications and other documents referred to in Article 3 of aforesaid contract accompanying the same shall in any wise affect its obligation on this bond; and such shall not be considered a novation, and it does hereby waive notice of any such change of the nature or terms of the contract, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications and the contract documents as referred to in Article 3 of aforesaid contract.

This bond shall be for the use of all persons doing work or furnishing skill, equipment, services, labor and materials under or for the purpose of this contract, in accordance with the laws of the State of Georgia, where applicable.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed this _____ day of _____, 19_____.

_____	(Individual Principal) (SEAL)
(Address)	(Business Address)
_____	(Individual Principal) (SEAL)
(Address)	(Business Address)
_____	(Individual Principal) (SEAL)
(Address)	(Business Address)

PERFORMANCE AND PAYMENT BOND

Attest: (Corporate Principal)

(Business Address)

(Affix Corporate Seal)

By

Attest: (Corporate Surety)

(Business Address)

(Affix Corporate Seal)

By

The rate of premium on this bond is _____ per thousand.

Total amount of premium charged, $_____.

(The above must be filled in by Surety Company)

DIRECTIONS FOR PREPARATION OF PERFORMANCE AND PAYMENT BOND

(1) Individual sureties, partnerships, or corporations not in the surety business will not be acceptable.

(2) The name of the Principal shall be shown exactly as it appears in the contract.

(3) The penal sum shall be not less than that required by the Specifications.

(4) If the Principals are partners, or joint venturers, each member shall execute the bond as an individual, with his place of residence shown.

(5) If the Principal is a corporation, the bond shall be executed under its corporate seal. If the corporation has no corporate seal the fact shall be stated, in which case a scroll or adhesive seal shall be affixed following the corporate name.

(6) The official character and authority of the person(s) executing the bond for the Principal, if a corporation, shall be certified by the secretary or assistant secretary thereof under the corporate seal, or there may be attached copies of so much of the records of the corporation as will evidence the official character and authority of the officer signing, duly certified by the secretary or assistant secretary, under the corporate seal.

(7) The current power-of-attorney of the person signing for the surety company must be attached to the bond.

(8) The date of the bond must not be prior to the date of the Contract.

(9) The following information must be placed on the bond by the surety company:

(a) The rate of premium in dollars per thousand; and

(b) The total dollar amount of premium charged.

(10) The signature of a witness shall appear in the appropriate place attesting to the signature of each party to the bond.

(11) Type or print the name underneath each signature appearing on the bond.

(12) An executed copy of the bond must be attached to each copy of the Contract (original counterpart) intended for signing.

GENERAL CONDITIONS

1. DEFINITIONS

Wherever used in any of the contract documents, the following meanings shall be given to the terms herein defined:

a. The "Contract" means the contract executed by the Local Authority and the Contractor, of which these General Conditions form a part. The documents which comprise the contract are set forth in the contract form.

b. The terms "Local Authority" and "Contractor" mean the respective parties to the contract.

c. The term "PHA" means the Public Housing Administration, successor in interest to the United States Housing Authority under Reorganization Plan 3 of 1947 (12 F.R. 4981), an agency and instrumentality of the United States of America created by the United States Housing Act of 1937 (Public No. 412, 75th Congress), as amended, which (subject to the provisions of a certain contract for financial aid between the Local Authority and the PHA) has agreed to purchase certain obligations of the Local Authority to aid in financing the work to be performed under the Contract. However, nothing contained in the Contract shall be construed to create any contractual relation between the Contractor and the PHA.

d. The "Architect" is the firm of Kuhlke and Wade, Architects, Augusta, Georgia under contract with the Local Authority for architectural and engineering services related to the work, and which firm may be represented by one or both of the Principals of that firm, or other person or persons designated by them in writing as being their authorized representative.

e. The "Project Engineer" is the on-site representative of the "PHA".

f. The term "Project" means the housing project, the construction work for which is contemplated in whole or in part under this contract.

g. The term "Specifications" means the volume which includes, and the term shall include, the Instructions and Forms (consisting of the Form of Invitation for Bids, Instructions to Bidders, Form of Bid, Form of Bid Bond, Form of Non-Collusive Affidavit, Form of Statement of Bidder's Qualifications, Form of Contract and Form of Performance and Payment Bond or Bonds), the General Specifications (consisting of the General Conditions, the Special Conditions, and the Schedule of Drawings) and the Technical Specifications.

h. The term "Drawings" means the drawings enumerated in the Schedule of Drawings.

i. The term "Contracting Officer" means the person within the Local Authority's organization duly authorized by the governing body thereof to administer construction contracts for and in the name of the Local Authority. It does not necessarily mean the person executing this Contract. The Local Authority shall advise the Contractor the person or official who is designated as Contracting Officer.

2. CONTRACTOR

a. Only one Contractor is recognized as a party to this Contract, and where the term "Contractor" is used the prime contractor who signed this Contract is referred to. For convenience, the Technical Specifications have been divided into separate divisions to cover the various trades represented in the work, and where "contractors" are referred to, such as "Mason Contractor", Carpenter Contractor", it is for convenience only.

b. The Contractor may authorize his Superintendent or other individual to sign, for him and in his name,

(1) The Schedule of Amounts for Contracts Payments
(2) Progress Schedule
(3) Periodical Estimates for Partial Payments and related papers
(4) Change Orders

Provided: Prior to the execution of the first of any such documents the Contractor has filed with the Local Authority a notarized statement evidencing such authorization and authenticating the signature to be so honored.

3. GENERAL RESPONSIBILITIES OF CONTRACTOR

a. Except as otherwise specifically stated in the Contract, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, heat, power, transportation, superintendence, temporary construction of every nature, taxes legally collectible because of the work, and all other services and facilities of every nature whatsoever necessary to execute the work to be done under the Contract and deliver it complete in every respect within the specified time.

b. The Contractor shall use his best efforts to complete the Contract efficiently and economically with the least number of changes possible and consistent with sound construction. He shall recommend to the Local Authority changes promoting economy or tending to produce more sound construction.

c. The Contractor shall give his personal superintendence to the work or have a competent superintendent, satisfactory to the Local Authority, on the work at all times during progress with full authority to act for the Contractor. The Contractor shall also provide a staff adequate to coordinate and expedite the work properly and shall, at all times, maintain competent supervision of his work and that of his subcontractors to assure compliance with contract requirements.

d. The Contractor shall lay out the work and be responsible for all lines, levels and measurements of all work executed under the Contract. He shall verify the figures before laying out the work and will be held responsible for any error resulting from his failure to do so.

4. SUBCONTRACTS

a. The Contractor shall not award any work to any subcontractor without prior written approval of the Local Authority, which approval will not be given until the Contractor submits to it a written statement containing such information as the Local Authority may require concerning the proposed sub contractor and the scope of the subcontract, together with the proposed sub contractor's non-collusive affidavit in the following form:

A F F I D A V I T

(Subbidder)

State of_____)ss.
County of_____)

_____, being first duly sworn, deposes and says:

That he is (a partner or officer of the firm of, etc.) the party making a certain proposal or bid dated _____19___ to (name of Contractor) _____ for subcontract work in connection with the construction of PH.-aided Housing Project No. GA 3-3 located in Athens, Georgia, and the party proposed by said (name of Contractor _____ as subcontractor for said work as a result of said bid, that such bid is geniune and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, soughy by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Housing Authority of The City of Athens, Georgia, or any person interested in the proposed contract; and that all statements in said proposal or bid are true.

_____

Signature of:
Bidder if the bidder is an individual;

Partner if the bidder is a partnership;

Officer if the bidder is a corporation.

_____

Subscribed and sworn to before me this _____ day of _____, 19_____.

_____

My commission expires _____, 19_____.

b. No proposed subcontractor shall be disapproved except for cause.

c. The Contractor shall be as fully responsible to the Local Authority for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

d. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions, Special Conditions and other documents comprising the Contract in so far as they are applicable to the work of sub contractors and to give the Contractor the same power as regards terminating any subcontract that the Local Authority may exercise over the Contractor under any provisions of the Contract. The Contractor shall insert in each of his subcontracts the provisions (appropriately modified) of Sections 37, 42, 43, 44, 45 and 50, of these General Conditions.

e. Nothing contained in the Contract shall create any contractual relation between any subcontractor and the Local Authority.

5. OTHER CONTRACTS

The Local Authority may award other contracts for additional work, and the Contractor shall fully cooperate with such other contractors and carefully fit his own work to that provided under other contracts as may be directed by the Local Authority. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor. Where more than one prime contractor is employed on the site it shall be the responsibility of the Local Authority to coordinate the work of all such prime contractors unless otherwise expressly provided herein.

6. FITTING AND COORDINATION OF THE WORK

The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, subcontractors, or materialmen engaged upon the work. He shall be prepared to guarantee to each of his subcontractors the dimensions which they may require for the fitting of their work to all surrounding work and shall do, or cause his agents to do, all cutting, fitting, adjusting, and patching necessary to make the several parts of the work come together properly and to fit the work to receive, or be received by, that of other contractors.

7. MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts or neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration, if such other contractor or subcontractor will so settle. If such other contractor or subcontractor shall assert any claim against the Local Authority on account of any damage alleged to have been so sustained, the Local Authority shall notify the Contractor, who shall defend at his own expense any suit based upon such claim, and, if any judgment or claims against the Local Authority shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith.

8. BREAKDOWN, PROGRESS SCHEDULE AND PERIODICAL ESTIMATES

a. For the purpose of preparing an acceptable progress schedule, and as a basis upon which partial payments to the Contractor may be authorized, immediately after execution of the Contract the Contractor shall furnish, on forms to be supplied by the Local Authority, a detailed estimate, (herein termed "Breakdown"), giving a complete breakdown of his Contract price, so arranged and itemized as to meet the approval of the Local Authority and of the PHA. If the contract covers more than one project, a separate breakdown shall be furnished for each project.

b. The values employed in making up this Breakdown are for the purpose of making partial payments and shall not be taken as a basis for additions to or deductions from the contract price.

c. Upon approval of the Breakdown the Contractor shall, without delay, submit for approval in like manner a carefully considered Progress Schedule, prepared in accordance with a specimen form and instructions supplied by the Local Authority, showing the proposed dates of starting and completing each of the various branches of the work, the anticipated monthly payments to become due the Contractor, and the accumulated percent of progress each month. This chart shall correspond to the major subdivisions of the approved Breakdown and incorporate information taken therefrom as required. If the Contract covers more than one project, a separate Progress Schedule shall be furnished for each project.

d. At the time of submitting his Progress Schedule the Contractor shall file also his general "Plan of Operations" showing concisely the manner in which he proposes to carry out the work on the site. The will indicate the point of entrance, the course he intends to pursue, the sequence of operations, the successive blocks of dwelling units to be ready for occupancy, and such other general information as will assist the Local Authority in planning its arrangements with others for services and materials not furnished by the Contractor, and in preparing for tenancy. Any later deviation from this Plan shall be discussed with and receive the concurrence of the Local Authority amply in advance of the date it is proposed to place it in effect.

e. In order to receive partial payments as the work progresses the Contractor shall submit, on forms supplied by the Local Authority, Periodical Estimates showing the value of the work performed each month, based upon the items appearing in the approved Breakdown. Such estimates must be submitted not later than ten days in advance of the date set for payment, and are subject to correction and revision as required. In final form they must bear the certification of both the Architect and the Local Authority before any payment may be made.

9. PAYMENTS TO CONTRACTOR

a. Subject to submission by the Contractor of the written certifications required of him and his subcontractors by Section 37 of the General Conditions, partial payments will be made as the work progresses on not later than the fifteenth day of each calendar month for work done during the preceding calendar month on estimates certified to by both the Architect and Local Authority. In preparing estimates the material delivered to and properly stored on the site and preparatory work done may be taken into consideration. Estimates for monthly payments must be submitted at least ten (10) days in advance of the date set for payment. If the Contract covers more than one project, a separate estima te shall be furnished for each project.

b. In making such partial payments for the work there shall be retained 10% of the estimated amount until final completion and acceptance of all work covered by the Contract: Provided, however, that after 50% of the work has been completed, if the Local Authority determines that the Contractor's performance and progress are satisfactory, the Local Authority may make the remaining partial payments in full for the work subsequently completed.

c. All material and work covered by partial payments made shall thereupon become the sole property of the Local Authority, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, whether such damage has been caused by the Contractor or by other contractors of the Local Authority or others, or as a waiver of the right of the Local Authority to require the fulfillment of all terms of the Contract. In the event the work of the Contractor has been damaged by other contractors or by others than the employees of the Local Authority in the course of their employment, the Contractor agrees to restore such damaged work without cost to the Local Authority and to seek redress for his damage only from those who directly caused it.

d. Upon completion and acceptance of all work required hereunder (exclusive of lawns and planting), the amount due the Contractor under this Contract, exclusive of the retention for lawns and planting work specified in the Special Conditions, shall be paid upon certification by the Architect and approval by the Local Authority and the PHA of all work exclusive of lawns and planting, after the Contractor shall have furnished the Local Authority with a release, in satisfactory form, of all claims against the Local Authority arising under and by virtue of this Contract, other than claims arising out of the lawns and planting operations and such other claims, if any, as may be specifically excepted by the Contractor from the operation of the release; provided, each such exception embraces no more than one claim, the basis and scope of which is clearly defined and the amount stated: and provided further, the amounts of such excepted claims are not included in the voucher for payment of the said amount due. Upon completion and acceptance of lawns and planting work and the furnishing of a supplemental release relating only to such work, under the same procedure and subject to the same conditions as are specified in this paragraph for the construction work, final payment exclusive of the retention to assure compliance with the guaranty for such work shall be made to the Contractor.

e. The Local Authority, before making any payment, may require the Contractor to furnish releases or receipts from all persons performing work and supplying material to the Contractor, if the Local Authority deems the same necessary in order to protect its interest. The Local Authority, however, may make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments so made shall in no wise impair the obligations of any surety or sureties on any bond or bonds furnished under this Contract.

f. The Local Authority may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Local Authority against any claims that may be urged against the Local Authority and if it so elects may also withhold any amounts due from the Contractor to any subcontractors or materialmen, for labor or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Local Authority and shall not require the Local Authority to determine or adjust any claims or disputes between the Contractor and his subcontractors or materialmen, or to withhold any moneys for their protection unless the Local Authority elects to do so. The failure or refusal of the Local Authority to withhold any moneys from the Contractor shall in nowise impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.

10. CHANGES IN THE WORK

a. The Local Authority may make changes in the work of the Contractor by making alterations therein, or by making additions thereto, or by omitting work therefrom, without invalidating the Contract, and without relieving or releasing the Contractor from any guarantee given by him pursuant to the Contract provisions, and without affecting the validity of the guaranty bonds, and without relieving or releasing the surety or sureties of said bonds. All such work shall be executed under the conditions of the original Contract.

b. Where any change in the work is required and ordered, the Contractor shall use his ability and buying power to obtain the best possible prices from material suppliers and subcontractors consistent with his general responsibility for the performance and completion of the work. To this end the Contractor, when submitting proposals for or billings in connection with the establishment of unit prices and costs of changes, shall be deemed to have represented by the submittal that he has used the lowest prices obtained or obtainable by him from his materialmen and subcontractors and that he has added nothing to such prices unless in the proposal or billing such contrary fact is specifically set forth. Should the Contractor at any time, without disclosing the fact, add any amount to any materialman's or subcontractor's proposal or bill, and should the Local Authority act on the same or make payment on any work covered by such estimate, proposal or billing, then and in that event the Local Authority shall have the right to recover from the Contractor any such amounts as may have been added to the materialman's or subcontractor's figures and not disclosed.

c. Except in an emergency endangering life or property, no change shall be made by the Contractor unless he has received a

prior written order from the Local Authority, approved on its face by the PHA, authorizing the change, and no claim for an adjustment of the Contract price or time shall be valid unless so ordered.

d. Any change in the work shall be ordered and the adjustment of contract price therefor shall be determined by one of the two following methods:

Method 1--Price Adjustment Before Performance

In any case where the change in contract price can be determined prior to performance of the change in the work, and if the parties can agree upon an equitable lump sum adjustment of the contract price prior to performance of the change in the work, a Change Order shall be issued establishing such adjustment. Under this Method 1, the evaluationof any item involved in the change for which a unit price has been duly established, and of the allowance of overhead and profit combined for extra work performed, shall be as prescribed under Method 2 hereof.

Method 2--Price Adjustment After Performance

In any case where the parties cannot determine and agree upon an equitable lump sum adjustment of the contract price prior to performance of the change in the work, a Proceed Order shall be issued authorizing the change and the Contractor shall proceed with the work thereof by the most economical methods. If net extra cost is anticipated such Proceed Order shall state the maximum sum, including all items of overhead and profit, for which it is valid and when such sum is exhausted the Contractor shall not proceed with the work without an additional and separate Proceed Order. If a credit is anticipated the Proceed Order shall state the minimum credit which will be allowed the Local Authority and any future adjustment of the contract price shall be for not less than such minimum. Upon completion of the change and determination of the cost thereof to the Local Authority a Change Order shall be issued establishing the equitable lump sum adjustment of the contract price.

For any item involved in the change for which a unit price has been duly established, either as provided in the Special Conditions of the Contract prior to its execution or by subsequent agreement and approval of such unit price by the PHA, the change in contract price shall be established by applying the unit price to the net quantity of the item involved and the result of this computation shall be added to or deducted from the contract price, as the case may be, without further allowance for overhead and profit.

For any items involved in the change for which unit prices have not been duly established the Contractor shall proceed on a time and material basis and shall keep an accurate account of the cost of such work and present it in such form, at such time, and substantiated by such supporting papers as the Local Authority may require. To such items of cost there shall be added, for extra work performed, the following allowances for overhead and profit combined.

(1) Fifteen (15%) percent of the net extra cost of labor and items incidental to labor, whether furnished by the Contractor or subcontractor.

(2) Eight (8%) percent of the net extra cost of material delivered to the site, including local sales taxes if any, whether furnished by the Contractor or subcontractor.

(3) Eight (8%) percent of the fair rental value of power tools or equipment for the additional time such tools or equipment are used in connection with the change in the work, regardless of the ownership of such items.

(4) Six (6%) percent of the net extra cost (including any overhead and profit allowed by the Contractor to the subcontractor within the percentages above prescribed) to the Contractor of all subcontracted work involved in the change.

e. The cost shall include all direct and necessary production costs of the work itself, i.e. labor and items incidental to labor (such as public liability and workmens' compensation insurance, old age and unemployment insurance, social security), pro-rata charges for foremen, material, and the use of power tools and equipment. Among the items to be considered as overhead and not as cost are insurance other than as mentioned above, premium on bond(s) required by the Contract, supervision, superintendents, timekeepers, clerks, watchmen, small tools, incidental job burdens, and general office expense.

f. For each Change Order issued the Contractor shall furnish to the Local Authority an itemized, bona fide, written proposal in multiple-copy form and with such supporting papers as the Local Authority may require.

g. During the progress of the work, if the Contractor encounters at the site (1) subsurface or latent physical conditions differing materially from those indicated in the Contract or (2) unknown physical conditions differing materially from those inhering in work of the character provided for in this Contract, he shall promptly, and before such conditions are disturbed, notify the Contracting Officer in writing. The Contracting Officer shall thereupon promptly investigate such conditions and if he finds that they do materially differ he shall cause such changes to be made in the Specifications and Drawings as he may deem necessary, if any, and shall make such equitable adjustment in the contract price or time as is justified, if any, by written order as provided in this Section 10 of the General Conditions. No claim of the Contractor for adjustment hereunder shall be allowed unless he has given notice as above required.

h. Subject to the provisions of Sections 11 and 13 of the General Conditions justifiable extensions of contract time because of changes or extra work, authorized by proper written order, may be granted by the Local Authority which order shall be approved on its face by the PHA.

11. CLAIMS FOR EXTRA COST

a. If the Contractor claims that any instructions by drawings or otherwise involve extra cost or extension of time, he shall, within ten days after the receipt of such instructions, and in any event before proceeding to execute the work, submit his protest thereto in writing to the Local Authority, stating clearly and in detail the basis of his objections. No such claim shall be valid unless so made.

b. Claims for additional compensation for extra work, due to alleged errors in spot elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more work, than would be reasonably estimated from the plans and topographical maps issued.

c. Any discrepancies which may be discovered between actual conditions and those represented by the topographical maps and plans shall be reported to the Local Authority at once, and work shall not proceed, except at the Contractor's risk, until written instructions have been received by him from the Local Authority.

d. If, on the basis of the available evidence, the Local Authority determines that an adjustment of the Contract price or time is justifiable, the procedure shall then be as provided herein for "Changes in the Work".

e. By execution of this Contract the Contractor warrants that he has visited the site of the proposed work and fully acquainted himself with the conditions there existing relating to construction and labor, and that he fully understands the facilities, difficulties, and restrictions attending the execution of the work under the Contract. The Contractor further warrants that he has thoroughly examined and is familiar with the Drawings, Specifications, and all other documents comprising the Contract. The Contractor further warrants that by execution of this Contract his failure when he was bidding on this Contract to receive or examine any form, instrument, or document, or to visit the site and acquaint himself with conditions there existing, in no wise relieves him from any obligation under the Contract and the Contractor agrees that the Local Authority shall be justified in rejecting any claim based on facts regarding which he should have been on notice as a result thereof.

12. RIGHT OF LOCAL AUTHORITY TO TERMINATE CONTRACT

If the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or fail to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to his employees or to his subcontractors, or persistently disregard instructions of the Local Authority or Architect or fail to observe or perform the provisions of the Contract, or otherwise be guilty of a substantial violation of any provision of the Contract, then the Local Authority may, by at least five days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Local Authority, terminate the Contractor's right to proceed with the work. In such event, the Local Authority may take over and prosecute the work to completion, by contract or otherwise, and the Contractor and his sureties shall be liable to the Local Authority for any excess cost occasioned the Local Authority thereby; and in any such case the Local Authority may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefor. The foregoing provisions are in addition to, and not in limitation of the rights of the Local Authority under any other provisions of the Contract.

13. DELAYS--DAMAGES

a. If the Contractor refuses or fails to prosecute the work, or any separable part thereof, wich such diligence as will insure its completion within the time specified in the special Conditions, or any extension thereof, or fails to complete said work within such time, the Local Authority may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been delay. In such event the Local Authority may take over the work and prosecute the same to completion, by contract or otherwise and the Contractor and his sureties shall be liable to the Local Authority for any excess cost occasioned the Local Authority thereby. If the Contractor's right to proceed is so terminated, the Local Authority may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefor. Until such time as the Local Authority terminates the right of the Contractor to proceed, the Contractor shall continue the work, and the Contractor shall pay to the Local Authority as fixed, agreed, and liquidated damages (it being impossible to determine the actual damages occasioned by the delay) for each calendar day of delay, until the work is completed, or accepted, or until such time as the Contractor's right to proceed shall be terminated, the amount as set forth in the Special Conditions, and the Contractor and his sureties shall be liable for the amount thereof. In the event the Local Authority shall at any time subsequent to the date of completion, as established in the Contract or any amendment thereto, terminate the Contractor's right to proceed, such termination shall not relieve the Contractor of the payment of the liquidated damages which have accrued from the completion date as established in the Contract, up to and including the date of the termination of the Contractor's right to proceed; Provided, That the right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages because of any delays in the completion of the work due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to acts of God, or of the public enemy, acts of the Government, acts of the Local Authority, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather or delays of subcontractors due to such causes, if the Contractor shall within 10 days from the beginning of any such delay (unless the Local Authority, with the approval of the PHA, shall grant a further period of time prior to the date of final settlement of the Contract) notify the Contracting Officer in writing of the causes of delay, who shall ascertain the facts and the extent of delay, and the Local Authority shall, subject to prior approval of the PHA, extend the time for com-

pleting the work when in its judgment the finds of fact of the Contracting Officer justify such an extension, and his findings of fact thereon shall be final and conclusive upon the parties hereto.

b. No payment or compensation of any kind shall be made to the Contractor for damages because of hindrance or delay from any cause in the progress of the work, whether such hindrances or delays be avoidable or unavoidable.

14. ASSIGNMENT OF CONTRACT

The Contractor's obligations and duties under this Contract shall not be assigned in whole or in part by the Contractor without the written approval of the Local Authority, but this shall not prohibit the assignment of the proceeds due hereunder to a bank or financial institution nor shall this provision preclude the Contractor from subletting, as provided in this Contract, parts of the work in accordance with the general practice of the building industry. This Contract may be assigned by the Local Authority to any corporation, agency, or instrumentality authorized to accept such assignment.

15. DISPUTES

a. All disputes, other than those required to be handled under Section 44 of the General Conditions, arising under this contract or its interpretations, whether involving law or fact, or both, or extra work, and all claims for alleged breach of contract shall within 10 days of commencement of dispute be presented to the Contracting Officer for decision. A copy of the notice of the dispute shall be forwarded to the Field Office of the Public Housing Administration. Such notice need not detail the amount of the claim but shall state the facts surrounding the claim in sufficient detail to identify the claim, together with its character and scope. In the meantime the Contractor shall proceed with the work as directed. The parties agree that any claim not presented within the time limit specified within this subsection is waived, except that if the claim is of a continuing character and notice of the claim is not given within ten days of its commencement, the claim will be considered only for a period commencing ten days prior to the receipt by the Local Authority of written notice thereof.

b. The Contractor shall submit in detail his claim and his proof thereof. The decision of the Contracting Officer shall be approved in writing by the Public Housing Administration prior to its issuance. Any decision not so approved shall be a nullity.

Each decision by the Contracting Officer shall be in writing and shall be mailed to the Contractor by registered mail, return receipt requested. A copy shall be delivered to the Project Engineer.

c. If the Contractor does not agree with any decision of the Contracting Officer, he shall except from the final release the decision in question.

d. Provided the Contractor has:

(1) given notice of any dispute within the time limit stated in 15a. above;

(2) presented his dispute to the Contracting Officer;

(3) taken exception in his release from the Contracting Officer's decision; and

(4) brought suit within 120 days after receipt of final payment under this Contract or within six months of a written request by the Local Authority that he submit a final voucher and release, whichever time is the lesser;

the Contracting Officer's decision shall not be final and conclusive but the dispute shall be tried in court on its merits. In the event the above conditions precedent have not been met, the Contractor hereby agrees that his non-compliance with the conditions precedent constitutes a waiver of his right to assert said claim.

16. SPECIFICATIONS AND DRAWINGS

Anything mentioned in the Technical Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Technical Specifications, shall be of like effect as if shown or mentioned in both. In case of difference between Drawings and Technical Specifications, the Technical Specifications shall govern. In case of any discrepancy in Drawings, or Technical Specifications, the matter shall be immediately submitted to the Local Authority, without whose decision said discrepancy shall not be adjusted by the Contractor, save only at his own risk and expense.

17. DRAWINGS

a. The general character of the detail work is shown on the Drawings but minor modifications may be made by the Architect in the full size drawings or models. The Contractor shall not

attempt to execute any part of the work requiring such drawings until he has received the same.

b. Where the word "similar" occurs on the Drawings, it shall be used in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to other parts of the work.

c. Where, on any Drawing, a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the work. Where ornament or other detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts in the work, unless otherwise indicated.

d. In case of differences between small and large scale drawings, the larger scale drawing shall take precedence.

18. OWNERSHIP OF DRAWINGS AND SPECIFICATIONS

Except the Contractor's executed set, all Drawings and the Specifications are and remain the property of the Local Authority. Such Drawings and Specifications are not to be used on other work, and those sets in usable condition shall be returned to the Local Authority, upon request, at the completion or cessation of the work or termination of the contract.

19. SHOP DRAWINGS

a. Shop drawings of all fabricated work shall be submitted to the Architect for approval and no work shall be fabricated by the Contractor, save at his own risk, until approval has been given. The Contractor will be advised as to the exact procedure to be followed with respect to the number of prints required, where submitted, letters of transmittal, making corrections, etc. No less than five (5) prints of finally approved shop drawings will be required.

b. The Contractor shall submit all shop drawings on dates sufficiently in advance of requirements to afford the Architect ample time for checking same, including time for correcting, resubmission, and recheck, if necessary, and no claim for extension of the contract time will be granted the Contractor by reason of his failure in this respect.

c. All shop drawings submitted must bear the stamp of approval of the Contractor as evidence that the drawings have been checked by the Contractor. Any drawings submitted without this stamp of approval will not be considered and will be returned

to the Contractor for proper resubmission. If the shop drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract even though such shop drawings have been approved.

d. Where a shop drawing as submitted by the Contractor indicates a departure from the Contract which the Architect deems to be a minor adjustment in the interest of the Local Authority not involving a change in Contract price or extension of time, the Architect may approve the drawing but the approval will contain, in substance, the following:

> "The modification shown on the attached drawing is approved in the interest of the Local Authority to effect an improvement for the project and is ordered with the understanding that it does not involve any change in the Contract price or time; that it is subject generally to all Contract stipulations and covenants; and that it is without prejudice to any and all rights of the Local Authority under the Contract and bond or bonds."

e. The approval of shop drawings will be general and shall not relieve the Contractor from the responsibility for adherence to the Contract, nor shall it relieve him of the responsibility for any error which may exist.

20. REQUESTS FOR SUPPLEMENTARY INFORMATION

a. It shall be the responsibility of the Contractor to make timely requests of the Architect, through the Local Authority, for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which he will require in the planning and production of the work. Such requests may be submitted from time to time as the need is approached, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay. Each request shall be in writing, and shall list the various items and the latest date by which each will be required by the Contractor. The first list shall be submitted within two weeks after Contract award and shall be as complete as possible at that time.

The Contractor shall, if requested, furnish promptly any assistance and information which the Architect may require in responding to the requests of the Contractor. The Contractor shall be fully responsible for any delay in his work or to others arising from his failure to comply fully with the provisions of this Section.

b. The Local Authority shall coordinate these activities between its Architect and the Contractor and shall expedite the flow of information so as to minimize delay in the progress of the development.

21. MATERIALS AND WORKMANSHIP

a. Unless otherwise specifically provided for in the Technical Specifications, all workmanship, equipment, materials and articles incorporated in the work shall be new and the best grade of the respective kinds for the purpose. Where equipment, materials, articles or workmanship are referred to in the Technical Specifications as "equal to" any particular standard, the Contracting Officer shall decide the question of equality.

b. The Contractor shall furnish to the Local Authority for approval the name of the manufacturer of machinery, mechanical and other equipment which he contemplates installing together with full information as to type, performance characteristics, and all other pertinent information as required, and shall likewise submit for approval as required full information concerning the materials or articles which he proposes to incorporate in the work. (See "Samples, Certificates and Tests", Section 22 of the General Conditions.)

c. Machinery, mechanical and other equipment, materials or articles installed or used without such prior approval shall be at the risk of subsequent rejection.

d. Materials specified by reference to the number or symbol of a specific standard, such as a Commercial Standard, a Federal Specification or other similar standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Invitation for Bids, except as limited to type, class or grade, or modified in such reference. The standards referred to, except as modified in the Technical Specifications shall have full force and effect as though printed therein.

e. Specific reference in the Technical Specifications to any article, device, product, material, fixture, form, or type of construction, etc., by name, make or catalog number shall be interpreted as establishing a standard of quality and shall not

be construed as limiting competition, and the Contractor, in such cases, may at his option use any article, device, product or material, fixture, form or type of construction which, in the judgment of the Contracting Officer, expressed in writing, is equal to that named.

f. The Local Authority may require the Contractor to dismiss from the work such employee or employees as the Local Authority or the Architect may deem incompetent, or careless, or insubordinate, or otherwise objectionable.

22. SAMPLES, CERTIFICATES AND TESTS

a. No samples shall be submitted with any bid nor before the award of the Contract and acceptance of the Contractor's Bond.

b. No material for which samples are required shall be delivered to the site for use until representative samples have been approved in writing by the Local Authority.

c. The Contractor shall furnish for approval all samples (and certificates related to them) as stipulated under the several divisions of the Technical Specifications as well as all other samples as requested by the Local Authority. Samples shall be delivered with all transportation charges prepaid to a location designated by the Local Authority and in ample time for proper consideration and action. In general, 20 days is the minimum time required for making tests.

d. Pack samples so as to reach their destination in good condition; ship in tight metal containers samples of paste or liquid materials.

e. Label, or otherwise properly mark on the container the material or product represented, its place of origin, the name of the producer, the name of the Contractor, and the name and symbol of the Project for which it is intended.

f. Submit to the Local Authority, in triplicate, a certificate describing each sample submitted for approval, certifying that the material, equipment or accessory submitted complies with Contract requirements. The certificates shall include the following information:

(1) Name and brand of the product, name of manufacturer, location of plant.

(2) Name and location of at least two structures on which substantial quantities of the material represented by the sample were used, and the approximate dates of use or installation.

(3) An outline showing chemical and physical properties of the material represented by the sample submitted and giving the name of the laboratory or testing authority which obtained the data, and the dates of the tests. (NOTE: The information required by this subparagraph f (3) may be omitted in the case of materials required to conform to Federal Specifications or A.S.T.M. Standards; Provided, A Certified statement by an acceptable laboratory or testing authority is furnished in lieu thereof.)

(4) If the statement originates with the producer, the Contractor shall endorse all claims and submit the statement in his own name; he shall also guarantee that all materials furnished for use on the Project will be in compliance with the samples and certified statements.

g. Approval of any material shall be general only and shall not constitute a waiver of the Local Authority's right to demand full compliance with Contract requirements. After actual deliveries, the Local Authority will make such check tests as it deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If materials, equipment or accessories which fail to meet check tests have been incorporated in the work, the Local Authority shall have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Contractor as is equitable.

h. When a material has been approved, no change in brand or make will be permitted unless:

(1) The manufacturer cannot make satisfactory delivery; or

(2) The material delivered fails to comply with the Contract requirements.

i. Wherever materials are required to comply with A.S.T.M. Standards or Federal Specifications, and such specifications shall be accepted as establishing the technical qualities and testing methods, they shall not govern the number of tests re-

quired to be made. The number of tests required on material delivered for use shall in all cases be at the discretion of the Local Authority. They may require laboratory tests on samples submitted for approval or they may approve materials on the basis of data submitted in certificates with the samples.

j. Check tests will be made on materials delivered for use only as frequently as the Local Authority considers necessary to insure compliance of materials used with Contract requirements.

k. Except as otherwise specifically stated in the Contract, the costs of sampling and testing will be divided as follows:

(1) The Contractor will furnish without extra cost, including packing and delivery charges, all samples required for testing purposes;

(2) The Contractor will assume all costs of re-testing materials which fail to meet contract requirements.

(3) The Contractor will assume all costs of testing materials offered in substitution for those found deficient; and

(4) The Local Authority will pay all other expenses.

l. Samples of materials not subject to destruction tests when approved will be sent to the Local Authority's Project office and kept there until completion of the work. They may be built into the work after a substantial quantity of the materials they represent have been built in and approved. Samples that are not approved will be returned to the Contractor only upon his request and at his expense; if the return of such samples is not requested within 30 days after rejection or disapproval, they will be treated as unclaimed material. The failure of samples to meet Contract requirements will be sufficient cause for refusal to consider any further samples from manufacturers whose materials have failed.

23. PERMITS AND CODES

a. The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. The intent of this Contract is that the Contractor shall base his bid upon the Drawings and Specifications, but that all work installed shall comply with all applicable codes and regulations as amended by any waivers. Before installing the work, the Contractor shall examine the Drawings and the Specifications for

compliance with applicable codes and regulations bearing on the work, and shall immediately report any discrepancy to the Local Authority. Where the requirements of the Drawings and the Specifications fail to comply with the applicable code or regulation, the Local Authority shall adjust by change order the Contract to conform to the code or regulation (unless waivers in writing covering the differences have been granted by the governing authority) and shall make appropriate adjustment in the Contract price. Should the Contractor fail to observe the foregoing provisions and install work at variance with any applicable code or regulation as may be amended by waivers (notwithstanding the fact that such installation is in compliance with the Technical Specifications), the Contractor shall remove such work without cost to the Local Authority, but a change order shall be issued to cover only the excess cost the Contractor would have been entitled to receive if the change had been made before the Contractor commenced work on the items involved.

b. Where the cost might otherwise fall upon the Contractor, the Local Authority will arrange for the issuance, WITHOUT COST TO THE CONTRACTOR by the appropriate local governmental agency, of permits and the waiving of fees normally charged in connection therewith, for water, demolition, side walks, sheds, removal of abandoned water taps, sealing of house connection drains, street openings, the repaving of streets and sidewalks and other building, electrical, plumbing, heating, gas and sewer permits necessary under any rule or regulation of the local regulatory body or any of its agencies and the Contractor shall not include in his bid price the cost of any such permits nor shall he include therein any inspection fees which might otherwise be charged against him therefor. The Contractor , however, shall make all necessary applications for securing any such required permits and shall obtain all such permits before commencing work. Notwithstanding the above, the Contractor may be reimbursed for fees, by the issuance of a change order, if (1) the Contractor finds that failure to pay such fees will delay construction of the project, (2) the Local Authority, after written notice from the Contractor, concurs in writing that substantial delay will result unless said fees are paid, and (3) the Contractor pays the fees under written protest. However, nothing in the above shall be construed as waiving any fees or costs to the Contractor in connection with obtaining of business licenses that may be normally required of contractors performing construction work or operating a business in the City of Athens, Georgia, the costs in connection with the obtaining of any such normally required licenses to be the responsibility of the respective contractors performing work on the project.

24. DOMESTIC AND FOREIGN MATERIALS

Except for materials listed in this section, only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States of America, and only such manufactured articles, materials, and supplies as have been manufactured in the United States of America substantially all from articles,materials, or supplies, mined, produced or manufactured, as the case may be, in the United States of America shall be employed under this Contract in the construction of the project.

The following have been exempted by the PHA from the foregoing provision:

Antimony	Jute	Copper, natural-nickel alloy
Asbestos	Kaurigum	Manganese Ore - 35% and over
Asphalt - native	Lac	Oil, China wood (tung oil)
Carnauba Wax	Mercury	Rubber - natural
Chromium	Mica	Sisal
Cork	Nickel	Tin
Flax	Platinum	Titanium
Hemp	Silk	Tungsten

25. CONVICT-MADE MATERIALS

No materials manufactured or produced in a penal or correctional institution shall be incorporated in the project under this Contract.

26. CARE OF THE WORK

a. The Contractor shall adopt reasonable methods during the life of the Contract to furnish continuous protection to the site and to the work, materials, and equipment thereon to the end that loss or damage may be prevented. He shall refuse entry to persons not having business on the site. He shall be responsible for all damages to persons or property that occur as a result of his fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance, whether or not the same has been covered by partial payments made by the Local Authority, and whether or not the damage to his work was caused by the Contractor or by other contractors or by other employees of the Local Authority in the course of their employment.

b. In the event of delay in completion of the contract work due to loss or damage caused by failure of the contractor to adopt reasonable and continuous protective methods, the contractor shall not be relieved from payment of liquidated damages because of such delay.

c. In an emergency affecting the safety of life or property, including adjoining property, the Contractor, without special instructions or authorization from the Local Authority, is authorized to act at his discretion to prevent such threatened loss or injury, and he shall so act. Likewise, he shall so act if instructed to do so by the Local Authority. Any compensation claimed by the Contractor on account of such emergency work shall be determined by the Local Authority, subject to PHA approval, and as provided in the Contract.

d. The Contractor shall avoid damage as a result of his operations to existing sidewalks, streets, curbs, pavements, utilities, adjoining property, the work of other contractors and the property of the Local Authority and others, and he shall at his own expense completely repair any damage thereto caused by his operations.

e. Wherever required by law, the Contractor shall shore up, brace, underpin, secure, and protect as may be necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the Project. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party before the commencement of any work. The Contractor shall indemnify and save harmless the Local Authority from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which the Local Authority may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

27. TEMPORARY HEATING

a. The Contractor shall provide and pay for temporary heating, covering and enclosures as directed by the Local Authority, and as necessary to protect properly all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. The fuel, equipment, materials and methods used shall at all times be adequate for the purpose, and satisfactory to the Local Authority. The Contractor shall maintain the critical installation temperatures called for in the Technical Specifications for various branches of the work in those spaces where such work is being performed. The maintenance of proper heat, ventilation, and adequate drying out of the work are the responsibilities of the Contractor and any work damaged by dampness, insufficient or abnormal heat shall be replaced to the satisfaction of the Local Authority by and at the expense of the Contractor.

b. The Contractor may utilize the permanent heating equipment which he furnished and installs under this Contract but shall supply any additional equipment required. Any permanent equipment so used shall be turned over to the Local Authority in the condition and at the time required by the Specifications.

28. ACCIDENT PREVENTION

The Contractor shall exercise proper precaution at all times for the protection of persons and property. The safety provisions of applicable law, building and construction codes shall be observed, and the Contractor shall take or cause to be taken such additional safety and health measures as the Local Authority may determine to be reasonably necessary. Machinery, equipment and all hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law.

29. SANITARY FACILITIES

The Contractor shall furnish, install and maintain ample sanitary facilities for the workmen. As the needs arise, enclosed temporary toilets, in sufficient number, shall be placed as directed by the Local Authority. Permanent toilets installed under this contract shall not be used during construction of the Project. Drinking water shall be provided from a proved safe source, so piped or transported as to be kept clean and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing governing health regulations.

30. USE OF PREMISES

a. The Contractor shall confine his apparatus, storage of materials, and construction operations to the limits prescribed by ordinances or permits, or as may be directed by the Local Authority, and shall not unreasonably encumber the premises with his materials.

b. The Contractor shall not load any structure or permit any part thereof to be loaded to such an extent as to endanger its safety.

c. The Contractor shall comply with and enforce any instructions of the Local Authority, or local laws regarding signs, advertising, fires, danger signals, barricades, and smoking.

d. The Contractor will be allowed to have a sales office on the site for sale of salvaged materials.

31. REMOVAL OF DEBRIS, CLEANING, ETC.

The Contractor shall, periodically or as directed during the progress of the work, remove and properly dispose of the resultant dirt and debris, and keep the premises reasonably clear. Upon completion of the work, he shall remove all temporary construction, facilities and unused materials provided for the work, and put the buildings and premises in a neat and clean condition, and do all cleaning and washing required by the Specifications. Trash and combustible materials shall not be allowed to accumulate in the buildings or elsewhere on the premises. Trash burning on the site will be subject to prior approval of the Local Authority and existing local and State regulations.

32. INSPECTION

a. All material and workmanship shall be subject to inspection, examination, or test by the Local Authority and the Architect at any and all times during manufacture or construction and at any and all places where such manufacture or construction is carried on. The Local Authority shall have the right to reject defective material and workmanship or require its correction. Rejected workmanship shall be satisfactorily corrected. Rejected material shall be promptly segregated and removed from the premises and satisfactorily replaced with proper material without charge therefor. If the Contractor fails to proceed at once with the correction of rejected defective material or workmanship, the Local Authority may by contract or otherwise have the defects remedied or rejected materials removed from the site and charge the cost of the same against any moneys which may be due the Contractor, without prejudice to any other rights or remedies of the Local Authority.

b. The Contractor shall furnish promptly all materials reasonably necessary for any tests that may be required. (See Samples, Certificates and Tests, Section 22 of the General Conditions.) All tests by the Local Authority shall be performed in such manner as not to unnecessarily delay the work. Special, full size, and performance tests shall be as described in the Technical Specifications.

c. If any work be covered up without approval or consent of the Local Authority, it must, if requested by the Local Authority be uncovered at the expense of the Contractor. Should it be considered necessary or advisable by the Local Authority at any time before final acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the Contractor shall on request promptly furnish all

necessary facilities, labor, and material. If such work is found to be defective in any material respect, due to fault of the Contractor or his subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, plus 15 per cent, shall be allowed the Contractor and he shall, in addition, if completion of the work of the entire Contract has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

d. Inspection of material and finished articles to be incorporated in the work at the site may be made at the place of production, manufacture, or shipment, whenever the quantity justifies it, unless otherwise stated in the Technical Specifications; and such inspection and acceptance, unless otherwise stated in the Technical Specifications, shall be final, except as regards (1) latent defects, (2) departures from specific requirements of the Contract, (3) damage or loss in transit, or (4) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of material and workmanship for final acceptance as a whole or in part shall be made at the site.

e. Neither inspection, testing, approval nor acceptance of the work, in a whole or in part, by the Local Authority or its agent shall relieve the Contractor or his Sureties of full responsibility for materials furnished or work performed not in strict accordance with the Contract.

33. REVIEW BY LOCAL AUTHORITY AND PHA

The Local Authority, the PHA, and their authorized representatives and agents shall, at all times, have access to and be permitted to observe and review all work, materials, equipment, pay rolls, personnel records, employment conditions, material invoices, contracts, books of account, and other relevant data and records; Provided, however, that all instructions and approvals with respect to the work shall be given to the Contractor only by the Local Authority, or its authorized representatives or agents.

34. FINAL INSPECTION

a. When the work is substantially completed the Contractor shall notify the Local Authority in writing that the work will be ready for final inspection on a definite date which shall be stated in such notice. Such notice shall be given at least ten (10) days prior to the date stated for final inspection, and the notice shall bear the signed concurrence of the representative of the Local Authority having charge of inspection.

b. If the Local Authority determines that the state of preparedness is as represented it will make the arrangements necessary to have final inspection commenced on the date stated in such notice, or as nearly thereafter as if practicable.

35. DEDUCTION FOR UNCORRECTED WORK

If the Local Authority deems it inexpedient to require the Contractor to correct work injured or not done in accordance with the contract, an equitable deduction from the Contract Price shall be made by agreement between the Contractor and the Local Authority, subject to prior approval of the PHA, and subject to settlement, in case of dispute, as herein provided.

36. INSURANCE

a. Before commencing work each Contractor shall submit to the Local Authority for review and approval his Workmen's Compensation and Manufacturers' and Contractors' Public Liability Insurance policies and shall similarly submit his subcontractors' policies before each commence work. Further, before commencing work on the superstructure each Contractor shall submit his Builder's Risk policy. The policies to be thus submitted shall be scheduled on an approval form to be supplied by the Local Authority. Such insurance shall be carried with financially responsible insurance companies approved by the Local Authority and shall be kept in force until the Contractor's work is accepted and taken over by the Local Authority. Contracts of insurance (covering operations under this Contract) which expire before the Contractor's work is accepted and taken over by the Local Authority shall be renewed and submitted to the Local Authority for its approval.

b. The Contractor shall carry Workmen's Compensation Insurance for all his employees engaged in work at the site, in accordance with State or Territorial Workmen's Compensation Laws. Each Contractor shall require his subcontractors to carry such insurance for all their employees working at the site.

c. The Contractor shall carry Manufacturers' and Contractors' Public Liability Insurance with Limits of $50,000/$100,000 to protect the Contractor against claims for injury to or death of one or more than one person as a result of accidents which may occur at the site from operations under the Contract. Each Contractor shall require his subcontractors to carry such insurance. Such insurance shall cover the use of all equipment, hoists, and vehicles on the site.

d. The Contractor shall carry Builder's Risk (fire and extended coverage) Insurance upon all work in place and/or materials stored at the building site including foundation and building equipment. The Contractor in installing equipment supplied by the Local Authority, such as ranges and refrigerators, shall carry insurance on such equipment from the time he takes possession thereof until his contract work is accepted by the Local Authority. Builder's Risk Insurance need not be carried on excavations, piers, footings or upon foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policy shall furnish coverage at all times for the full cash value of all completed construction as well as materials in place and/or stored at the site, whether or not the partial payment has been made by the Local Authority. The Contractor may terminate this insurance on buildings taken over for occupancy by the Local Authority pursuant to Section 11 of the Special Conditions as of the date said buildings are taken over.

e. The Contractor shall carry, during the life of the Contract, Property Damage Insurance in an amount of not less than $5,000 to protect him and his subcontractors from claims for property damage which might arise from operations under the contract.

37. PREVAILING SALARIES OR WAGES

a. The Contractor shall pay to all architects, technical engineers, draftsmen, and technicians employed in connection with this contract not less than the salaries or wages prevailing in the locality of the Project, as determined or adopted (subsequent to a determination under applicable State or local law) by the PHA.

b. The Contractor shall pay to all laborers and mechanics employed in the development of the Project not less than the wages prevailing in the locality of the Project, as predetermined by the Secretary of Labor of the United States pursuant to the Davis-Bacon Act (Title 40, U.S.C., Secs. 276a - 276a-5).

c. All laborers and mechanics employed in the development of the Project shall be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Anti-Kickback Regulations (29CFR Part 3), the full amounts due at time of payment computed at wage rates not less than those contained in the wage determination decision of the Secretary of Labor of the United States, the substance of which is included in the Special Conditions, regardless of any contractual relationship which may be alleged to exist between the Contractor or subcontractor and such laborers and mechanics; and the wage determination decision shall be posted by the contractor at the site of the work in a prominent place where it can be easily seen by the workers.

d. If the Contractor or any of his subcontractors finds it necessary or desirable to exceed the prevailing salary or wage rates specified in his contract, any expense incurred by the Contractor or subcontractors because of the payment of salaries or wages in excess of such amounts shall not be cause for any increame in the amount payable under his Contract. The Local Authority shall not consider or allow any claim for additional compensation made by the Contractor or subcontractors because of such payments.

e. The Local Authority will not make any payment under this Contract unless and until the Local Authority has received an affidavit from the Contractor that such Contractor and each of his subcontractors has made payment to each class of employees in compliance with the applicable provisions of a, b, and c of this Section.

f. Apprentices shall be employed in the development of the Project only under a bona fide apprenticeship program registered with a State Apprenticeship Council which is recognized by the Federal Committee on Apprenticeship, United States Department of Labor, or if no such recognized Council exists in a State, under a program registered with the Bureau of Apprenticeship, United States Department of Labor.

g. No laborer or mechanic employed in the development of the Project shall be discharged or in any other manner discriminated against because such laborer or mechanic has filed any complaint or instituted or caused to be instituted any proceedings or has testified or is about to testify in any proceedings under or relating to the labor standards incorporated in this Construction Contract.

h. If, after the award of the Contract, it becomes necessary to employ any person in a trade or occupation not classified in the list contained in the Special Conditions, such person shall be paid at not less than such rate as shall be determined by the Secretary of Labor, or by applicable State law, whichever is the higher, and such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. The Contractor shall notify the Local Authority of his intention to employ persons in trades or occupations not classified in sufficient time for the Local Authority to obtain approved rates for such trades or occupations.

38. HOURS OF WORK

Architects, technical engineers, draftsmen, technicians, laborers, and mechanics shall not be permitted to work more than eight hours per day nor more than 40 hours per week, unless such employees are paid at least time and a half for hours of work in excess of the limits prescribed above. The said limits shall not apply to executive, supervisory, or administrative, employees, as such. If there is a State or local law applicable to any or all of the foregoing classes of employees prescribing hours of work not in excess of the hours above prescribed the Local Authority will require compliance with the State or local laws applicable to such class or classes, instead of compliance with the above requirements.

39. QUALIFICATIONS FOR EMPLOYMENT

a. No persons under the age of sixteen (16) years and no person undergoing sentence of imprisonment at hard labor shall be employed in the development of the Project. No person whose age or physical condition is such as to make his employment dangerous to his health or safety or to the health and safety of others shall be employed in the development of the Project; provided, that this shall not operate against the employment of physically handicapped persons, otherwise employable, where such persons may be safely assigned to work which they can ably perform.

b. In connection with the performance of the work under this contract, the contractor agrees not to discriminate against any employee or applicant for employment because of race, religion, color, or national origin. The aforesaid provision shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of the nondiscrimination clause. The contractor further agrees to insert the foregoing provision in all subcontracts hereunder, except subcontracts for standard commercial supplies or raw materials.

40. PERSONS ENTITLED TO BENEFITS OF LABOR AND MATERIALS PROVISIONS

a. The Contractor and each subcontractor shall extend to every person who performs for him the work of an architect, technical engineer, draftsman, technician, laborer, or mechanic on

the Project, or on any part thereof, or in any connection therewith, the benefits of the labor and wage provisions of this Contract regardless of any contractual relationship between the Contractor and such person, or between any subcontractor and such person.

b. The Contractor shall promptly pay all amounts due from him for services rendered, work performed and materials supplied.

41. WEEKLY PAYMENTS

Every employee of the Contractor or a subcontractor shall be paid in lawful money of the United States, or by check if the Contractor provides or secures convenient and satisfactory facilities approved by the Local Authority for the cashing of the same without cost or expense to the employee, in the full amount accrued to each individual at the time of closing of the payroll, which shall be at the latest date practicable prior to the date of payment, and there shall be no deductions or rebates on account of goods purchased, rent, or other obligations, but such obligations shall be subject to collection only by legal process.

42. NON-REBATE OF WAGES

The Contractor agrees to comply with the regulations, rulings, and interpretations of the Secretary of Labor of the United States pursuant to the Anti-Kickback Act (Title 18, U.S.C., Sec. 874 and Title 40, U.S.C., Sec. 276c) which makes it unlawful to induce any person employed in the construction or repair of public buildings or public works to give up any part of the compensation to which he is entitled under his contract of employment; and the contractor agrees to insert a like provision in all subcontracts hereunder.

43. SUBMITTAL OF PAYROLLS AND RELATED REPORTS

a. The Contractor shall, not later than the 7th day following the payment of wages, submit to the Local Authority two legible copies of his payroll and of the payrolls of each of his subcontractors, each with the Payroll Summary completed and the Affidavit notarized on the back of the final sheet. These copies shall be prepared on forms which will be furnished to the Contractor by the Local Authority.

b. Payroll records shall be maintained during the course of the work and preserved for a period of three years thereafter, for all laborers and mechanics employed in the development of the Project. Such records shall contain the name and address of each such employee, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and

actual wages paid. The Contractor shall submit weekly to the Local Authority such copies and summaries (on forms prescribed by the PHA and furnished by the Local Authority) of all his payrolls and those of each of his subcontractors, as the Local Authority or the PHA may require. Each payroll and summary shall be accompanied by an affidavit to the effect that (1) such payroll is correct and complete, (2) the wage rates contained therein are not less than those determined by the Secretary of Labor of the United States, and (3) the classifications set forth for each laborer or mechanic conform with the work performed. The Contractor shall make his employment records available for inspection by authorized representatives of the Local Authority, the PHA, and the United States Department of Labor, and shall permit such representatives to interview employees during working hours on the job.

c. The Contractor shall also furnish to the Local Authority any other information or certifications relating to employees in such form as the Local Authority may request.

44. DISPUTES CONCERNING WAGE RATES AND CLASSIFICATION OF LABOR

a. All disputes concerning prevailing wage rates or classifications arising under this Contract involving (1) significant sums of money, (2) large groups of employees, or (3) novel or unusual situations shall be promptly reported by the Local Authority to the PHA for decision or, at the option of the PHA, referral to the Secretary of Labor of the United States. The decision of the PHA or the Secretary of Labor, as the case may be, shall be final.

b. All questions arising under this Contract relating to the application or interpretationof the Anti-Kickback Act or Sec. 16(2) of the Act shall be referred to the Secretary of Labor of the United States for ruling or interpretation, and such ruling or interpretation shall be final.

45. WAGE CLAIMS AND ADJUSTMENTS

In cases of underpayment of salaries or wages to any architects, technical engineers, draftsmen, technicians, laborers, or mechanics by the Contractor or any of his subcontractors, the Local Authority may withhold from such Contractor out of payments due, an amount sufficient to pay persons employed on the work covered by the Contract the difference between the salaries or wages required to be paid under the Contract and the salaries or wages actually paid such employees for the total number of hours worked,and the amounts withheld may be disbursed by the Local Authority for and on account of the Contractor or the subcontractor to the respective employees to whom they are due. The

Local Authority shall in cases of such underpayment withhold such monies: Provided , That the Local Authority shall not be considered in default under this sentence if it has in good faith made payments to the Contractor in reliance upon an affidavit of the Contractor that the salaries and wages required under his Contract have actually been paid.

46. PATENTS

The Contractor shall hold and save the Local Authority, its officers, and employees, harmless from liability of any nature or kind, including costs and expenses, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the Local Authority, unless otherwise specifically stipulated in the Contract.

47. WARRANTY OF TITLE

No material, supplies, or equipment for the work shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor warrants good title to all materials, supplies, and equipment installed or incorporated in the work and agrees, upon completion of all work, to deliver the premises together with all improvements and appurtenances constructed or placed thereon by him to the Local Authority free from any claims, liens, or charges and further agrees that neither he nor any person, firm or corporation furnishing any material or labor for any work covered by this contract shall have any right to a lien upon the premises or any improvement or appurtenance thereon, provided that this shall not preclude the Contractor from installing metering devices and other equipment of utility companies or of municipalities, the title to which is commonly retained by the utility company or the city. In the event of the installation of any such metering device or equipment, the Contractor shall advise the Local Authority as to the owner thereof. Nothing contained in this paragraph, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Local Authority. The provisions of this paragraph shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

48. GENERAL GUARANTY

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use or occupancy of the premises by the Local Authority shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of one year from the date of final acceptance of the work (exclusive of lawns and planting) unless a longer period is specified. The Local Authority will give notice of observed defects with reasonable promptness. The Contractor shall also comply with the guaranty for lawns and planting work stipulated in the Technical Specifications for that branch of the work.

49. INTEREST OF MEMBER OF CONGRESS

No member of or delegate to the Congress of the United States of America or Resident Commissioner shall be admitted to any share or part of this Contract or to any benefit to arise therefrom; Provided that this provision shall not be construed to extend to this Contract if made with a corporation for its general benefit.

50. TERMINATION BECAUSE OF VIOLATION OF WAGE PROVISIONS

This Contract may be terminated by the Local Authority upon default by the Contractor of any of the provisions of Sections 37, 42, 43, 44 and 45.

51. INTEREST OF MEMBERS, OFFICERS, OR EMPLOYEES AND FORMER MEMBERS, OFFICERS, OR EMPLOYEES

No member, officer, or employee of the Local Authority, or former member, officer, or employee of the Local Authority who ceased to be a member, officer, or employee within one year shall voluntarily acquire any interest, direct or indirect, in any property included or planned to be included in the project, or in this contract or any subcontract relating to the project. If any such person involuntarily acquires any such interest or had acquired any such interest prior to appointment or employment as such member, officer, or employee, then such person shall immediately disclose any such interest in writing to the Local Authority. Upon any such disclosure, a member, officer or employee shall not participate in any action by the Local Authority relating to the property or contract in which he may have any such interest.

52. REMOVAL AND SALVAGE OF EXISTING BUILDINGS

a. Upon receipt by the Contractor of a Notice to Proceed with the work on all or any part of the premises, all right, title and interest of the Local Authority in and to buildings, structures, and other property to be demolished and/or removed by the Contractor, on said part or all of the premises as described in such Notice, shall be deemed to be vested in the Contractor, subject to all provisions of the Contract and the following:

(1) No right, title, property or interest of any kind whatsoever in or to land or premises upon which such buildings or structures stand, is created, assigned, conveyed, granted or transferred to the Contractor, or any other person or persons, except only the license and right of entry to remove such buildings and structures in strict accordance with the Contract.

(2) Property belonging to public bodies or public service companies shall not become the property of the Contractor by reason of the transfer herein provided for, and the Local Authority does not warrant title to such property.

(3) Except as otherwise provided all salvage and materials become the property of the Contractor and shall be taken from the premises. Storage of materials and equipment on the site will not be permitted. All rubbish and debris found existing on the site at the start of the work shall be removed from the premises.

(4) Personal property of third persons or of occupants of buildings on the site shall not become the property of the Contractor.

(5) If the Local Authority terminates the Contractor's right to proceed in accordance with Section, RIGHT OF LOCAL AUTHORITY TO TERMINATE CONTRACT, or DELAYS-DAMAGES, of the General Conditions all right and all title in and to buildings, structures, material and property transferred by this Section shall revert to and vest in the Local Authority without prejudice to any claim which the Local Authority may have against the Contractor arising from the Contractor's default.

(6) Materials left on the site, after acceptance of the work by the Local Authority, shall be deemed to have been abandoned by the Contractor to the Local Authority and title thereto shall thereupon revert to and vest in the Local Authority, without prejudice, however, to any claim which the Local Authority may have against the Contractor arising from the action of the Contractor in so leaving such materials on the site.

(7) If the Technical Specifications provide that the Contractor may elect to remove underground utilities with title thereto being vested in the Contractor, he shall, within ten days after the award of the Contract, notify the Local Authority of his election to remove such property. If any such property is not removed within the time for completion of that portion of the work within which it lies, or any extension thereof, title to such property not removed shall revert to the Local Authority.

b. Unless otherwise specified, no dwelling buildings shall be removed from the premises as a whole, or in a substantially whole condition, but shall be demolished on the premises.

53. LIVE UTILITIES AND OTHER PROPERTY

a. The Contractor shall assume all responsibility for damage to any property upon, or passing through, the site but excluded from the work or not owned by the Local Authority, such as utility lines or like items.

b. Where disconnections of underground services are required to be made at street mains the Contractor shall, at his own expense, restore the pavement over such cuts in accordance with local regulations.

SPECIAL CONDITIONS

1. PROJECT SITE

The project site of Housing Project No. Ga 3-3 consists of that area within the property limits bounded in general on the East by privately owned property, on the South by Baxter Street, on the West by Findley Street, and on the North in part by privately owned property, and in part by Waddell Street, the above described property lying on either side of Newton Street which intersects the property, and all within the city of Athens, Clarke County, Georgia, all as shown on the Property Line Map: Plan No. P.L.M. Project GA 3-3, Sheet No. X-1 of 5.

2. TIME FOR COMPLETION

a. The work shall be commenced at the time stipulated in the Notice to Proceed to the Contractor and shall be fully completed within 300 consecutive calendar days thereafter, exclusive of Landscaping. An additional 150 consecutive calendar days will be allowed in which to complete Landscaping, exclusive of maintenance and replacement.

3. LIQUIDATED DAMAGES

a. As actual damages for any delay in completion are impossible of determination the Contractor and his Sureties shall be liable for and shall pay to the Local Authority the sums hereinafter stipulated as fixed, agreed, and liquidated damages for each calendar day of delay until the work is completed or accepted.

(1) $1.00 per dwelling unit per calendar day applicable to dwelling units and related work not completed, suitable for occupancy, including utilities, sidewalks and driveways servicing such units, exclusive of landscaping within the number of consecutive calendar days from the established starting date;

(2) $10.00 per calendar day applicable to all the balance of the contract work except landscaping; and

(3) $10.00 per calendar day applicable to Landscaping.

b. The Local Authority may accept any part of the work if there has been such a degree of completion as will, in its opinion, make such part reasonably safe, fit, and convenient for the use and accommodation for which it was intended.

4. COMMUNICATIONS

a. All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

b. Any notice to or demand upon the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the Contract (or at such other office as he may fromtime to time designate in writing to the Local Authority), or deposited in the United States mail in a sealed, postage-prepaid envelope, or if delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

c. All papers required to be delivered to the Local Authority shall, unless otherwise specified in writing to the Contractor, be delivered to the Executive Director of The Housing Authority of The City of Athens, Georgia, at No. 1 Parkview Homes, Athens, Georgia, and any notice to or demand upon the Local Authority shall be sufficiently given if so delivered, or deposited in the United States mail in a sealed, postage-prepaid envelope, or

delivered with charges prepaid to any telegraph company for transmission to said Executive Director at such address, or to such other representatives of the Local Authority or to such other address as the Local Authority may subsequently specify in writing to the Contractor for such purpose.

d. Any such notice shall be deemed to have been given as of the time of actual delivery or (in the case of mailing) when the same should have been received in due course of post, or in the case of telegrams, at the time of actual receipt, as the case may be.

5. SIGNS

Subject to prior approval of the Local Authority as to size, design, type, and location, and to local regulations, the Contractor and his subcontractors may erect temporary signs for purposes of identification and controlling traffic. The Contractor shall furnish, erect, and maintain such signs as may be required by Safety Regulations and as necessary to safeguard life and property.

6. JOB OFFICES

a. The Contractor shall furnish and maintain, during construction of the Project, adequate facilities at the site for the use of the Local Authority, Architect, and the PHA, as follows:

> The facilities and services to be provided by the Contractor shall consist of a temporary building subdivided into spaces as shown on the schematic plan, to be of neat substantial and weathertight construction, with doors as shown, windows as necessary to provide adequate light and ventilation, hardware as necessary to make doors and windows secure, partitions of construction to provide privacy and a reasonable degree of soundproofness, and toilet facilities with cold water connections to fixtures; electric lights of type and extent required to provide adequate illumination and two duplex receptacles in each office at locations to be directed; local telephone service consisting of a separate direct telephone for each of the two offices; heat and janitor services; and furnishings consisting of shelving, plan racks, and plan tables as indicated; cylinder type locks shall be provided for the outside entrance door, the sample storage room, and each office and closet door.

b. The Contractor and his subcontractors may maintain such office and storage facilities on the site as may be necessary in the proper conduct of the work. These shall be located so as to cause no interference to any work to be performed on the site. The Local Authority shall be consulted with regard to locations.

c. Upon completion of the Project, or as directed by the Local Authority, the Contractor shall remove all such temporary structures and facilities from the site, same to become his property, and leave the premises in the condition required by the Contract.

7. MINIMUM RATES OF PAY

The following minimum rates have been determined and adopted in accordance with the provisions contained in the General Conditions and not less than the rates listed herein shall be paid to the following trades and occupations:

Classification	Per Hour
Asbestos workers	$3.25
" " improvers:	
1st year	1.625
2nd "	1.95
3rd "	2.275
4th "	2.60
Boilermakers-Blacksmiths	3.25
" " helpers	3.00
Bricklayers:	
Bricklayers	2.90
Stone masons	2.90
Marble masons	2.25
Terrazzo workers	2.25
Tile setters	2.25
Carpenters:	
Carpenters	2.00
Soft floor layers	2.00
Cement masons	2.50
Electricians	3.20
Wagon drill operator	1.75
Elevator constructors	3.16
" " helpers	2.21
Ironworkers:	
Ironworkers, structural	3.05
" ornamental	3.05
" reinforcing	2.80
Laborers:	
Air tool operator	1.10
Laborers, construction	1.00
Mason tenders	1.10
Mortar mixers, hand	1.00

SPECIAL CONDITIONS

Classification	Per Hour
Pipe layers (concrete & clay)	$1.10
Plasterers tenders	1.10
Lathers	3.00
Mortar mixer (machine)	1.40
Painters, roller	3.225
" brush	2.85
" stage (over 8 ft.)	3.10
" " (over 5 stories)	3.35
" steel (erected or not)	3.10
" " (over 25 ft.)	4.10
" spray	5.70
Steeple jacks (tanks & towers) up to 200 ft.	3.85
" " " " over 200 ft.	4.85
Decorators	2.85
Finishers	2.85
Glaziers	2.35
Paperhangers	3.10
Plasterers	3.00
Plumbers:	
Plumbers	3.30
Steamfitters	3.30
Roofers (damp or waterproofers)	2.00
Sheet metal workers	3.00
Sprinkler fitters	3.25
Truck drivers	1.00
Welders, riggers and riveters - receive rate prescribed for craft performing operation to which welding, rigging and riveting are incidental	
Hod carriers	1.15
Powderman	1.75

Apprentice Schedule

Craft	Interval	Period and Rate* 1st	2nd	3rd	4th	5th	6th	7th	8th
Electricians	6 mos.	40	45	50	50	60	60	70	70
Ironworkers, structural & ornamental	6 mos.	1.42	1.70	1.90	1.90				
Ironworkers, reinforcing	6 mos.	1.30	1.56	1.73	1.73				
Lathers	4 mos.	1.10	1.30	1.45	1.65	1.80	1.95	2.05	2.30
Painters	6 mos.	50	58	66	74	82	90		
Plasterers	6 mos.	40	45	50	55	60	70	80	90
Plumbers - Steamfitters	6 mos.	1.55	1.65	1.65	1.75	1.75	1.85	1.85	1.95
Roofers	6 mos.	70	75	80	85	90	95		
Sheet metal workers	6 mos.	40	45	50	55	60	65	70	80
Sprinkler fitters	6 mos.	63	66	69	72	75	78	81	84

Apprentice Schedule (Continued)

Craft	Period and Rate * Interval	9th	10th
Electricians	6 mos.	80	80
Lathers	4 mos.	2.50	
Plumbers-Steamfitters	6 mos.	1.95	2.05
Sprinkler fitters	6 mos.	87	90

*The apprentice rate is by percentage of the journeyman's rate unless otherwise indicated.

Power equipment operators:	Per Hour
Oilers on ditching machines (on depth of 7 ft. or more)	$1.90
Apprentice engineer (oiler)	1.90
Air compressors (portable & stationary)	2.20
Mechanic helper	1.90
Concrete mixer, under 5 bags	2.05
Fireman, stationary & portable	2.20
Pump operator	2.05
Roller operator	2.20
Barber green loader	2.05
Tractor (farm type)	2.05
Well drill operator	2.05
Distributor (bituminous surf)	2.20
Finishing machines (cement, concrete, paving)	2.20
Oiler on truck cranes	2.30
Air compressor on steel erection	2.30
Bulldozer operator over 40 h.p.	2.525
Concrete mixer, over 5 bags	2.30
Dredge operator	2.30
Hoist - 1 drum	2.45
Hoist - 2 drums	2.80
Hoist - 3 drums	3.00
Dozer - shovel	2.525
Locomotive engineer	2.30
Motor patrol	2.525
Pump crete operator	2.30
Rock crusher	2.50
Scraper pans (carry-all type)	2.525
Tractor with special equipment	2.525
Turnerpull operator	2.525
Asphalt plant operator	2.45
Paving machine	2.60
Trenching machine	2.80
Mechanic operator	To take machine rate
Backhoe operator	3.05
Clamshell operator	3.05

Power equipment operators:(continued)	Per Hour
Crane operator	$3.05
Dragline operator	3.05
Derrick operator	3.05
Elevating grader	2.85
Pile driver	3.05
Shovel operator	3.05
All machines used erecting steel, boiler, handling of machinery and the setting of stone and concrete and pouring concrete.	3.05
Apprentice engineer on crawler equipment (1st 3 mos)	1.90
Apprentice engineer on crawler equipment (2nd 3 mos)	2.05
After 6 months, journeymen rate to apply.	
Batch plant operator (on contractor owned plant)	1.90
Conveyor operator (chain or belt)	1.90

a. The wage rates contained in this decision are straight hourly wage rates. In some areas management and labor organizations in the construction industry have collectively bargained for health and welfare fund contributions. Such contributions are not included in wage rates determined by the Secretary of Labor for Construction projects.

b. Apprentices employed pursuant to this determination of wage rates must be registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Federal Committee on Apprenticeship, U. S. Department of Labor; or, if no such recognized agency exists in a State, it shall mean a program registered with the Bureau of Apprenticeship, U. S. Department of Labor.

8. UNIT PRICES

a. The unit prices for the items set forth in this Section are subject to mutual agreement and to the approval of the PHA, and when so approved become a part of the contract. The Contractor, when submitting proposals for the establishment of unit prices shall be deemed to have represented by the submittal that he has used the lowest prices obtained or obtainable by him from his materialmen and subcontractors and that he has added to such prices in the proposal only such amounts as are specifically set forth in such proposal. Should the Contractor, without disclosing the fact, add any amount to any materialman's or subcontractor's proposal the Local Authority shall have the right to deduct from any billing based on such unit price any such amounts as may have been added to the materialman's or subcontractor's figures and not disclosed.

b. It is mutually understood and agreed that such approved unit prices include all items of cost, overhead and profit for the Contractor and any subcontractor(s) involved, and that they shall be used uniformly without modification for either additions or deductions, and that they shall be established in the contract by means of a "UNIT PRICE AGREEMENT" in a form satisfactory to the Local Authority and the PHA. The unit prices as established shall be used to determine the equitable adjustment of the contract price in connection with changes or extra work performed under the Contract and the "Rules of Measurement" hereinafter set forth shall govern.

c. The following rules of measurement shall apply in the use of unit prices:

(1) Except as provision is made hereinafter for arbitrary measurement the quantity of excavation shall be its in-place volume before removal.

(2) Where rock excavation replaces earth excavation required under the contract such earth excavation shall be credited.

(3) The reference point for computing changes in depth shall be the plan grade at which the change starts.

(4) No allowance will be made for excavating additional material of any nature taken out for the convenience of the Contractor beyond the quantity computed under these Rules of Measurement.

(5) The quantity of rock excavation shall be computed from instrument readings taken by the Local Authority in vertical cross sections located at such intervals as will insure accuracy. Top elevations of the rock shall be taken upon exposure but before disturbance. Bottom elevations shall be plan grade if the rock continues to the bottom of the excavation. If the rock dies out above plan grade, bottom elevations shall be the instrument reading of the bottom of the rock layer in each cross section. The definition of "rock" contained in the Technical specification shall govern and computations of quantities shall, in all respects, be in strict accordance with these Rules of Measurement.

(6) General excavation for buildings shall arbitrarily be assumed to extend to vertical planes two feet outside of the outside wall lines, and to the elevation of plan subgrade.

(7) Trenches for walls and grade beams shall arbitrarily be assumed to be two feet wider than wall or grade beam thickness but in no case less than three feet wide, and with sides vertical.

(8) Trenches for pipes shall arbitrarily be assumed to be two feet wider than the outside diameter of the pipe barrel, and with sides vertical.

(9) Excavation for a footing (the pad) under a wall shall be measured as the neat plan width and depth of the footing. If the wall is raised or lowered without change in such footing dimensions the change in excavation shall be computed entirely under Rule (7).

(10) Excavation for footings for columns or piers shall be computed as vertical shafts, each with a horizontal cross section identical in shape and size with the bottom of the footing.

(11) The volume of backfill shall be the volume of excavation computed under these Rules of Measurement less the volume of actual displacement by walls, beams, columns, piers, footings or other construction installed.

(12) The quantities of form work shall be the area of forms in contact with concrete. The quantities of sheathing of banks shall be computed as the area of the banks against which sheathing is installed.

(13) Concrete quantities shall be computed from plan size or, if there are no drawings, from actual measurement of the work ordered and placed.

d. General Provisions. Each unit price shall cover, amont other things, engineering (surveying) costs and all costs of keeping excavations dry. For items (1) through (12) below there shall be one set of unit prices for excavation in rock as the same is defined in the Technical Specification and another set of unit prices for excavation in material other than rock as so defined.

(1)	General excavation, left on site as directed	Per cu. yd.
(2)	General excavation, removed from site	Per cu. yd.
(3)	Trench excavation for walls and wall footings, left on site as directed	Per cu. yd.
(4)	Trench excavation for walls and wall footings, removed from site	Per cu. yd.
(5)	Trench excavation for pipes, outside building lines, left on site as directed	Per cu. yd.
(6)	Trench excavation for pipes, outside building lines, removed from site	Per cu. yd.
(7)	Trench excavation for pipes, inside building lines, left on site as directed	Per cu. yd.
(8)	Trench excavation for pipes, inside building lines, removed from site	Per cu. yd.
(9)	Pier and column footing excavation, and excavation for pits, left on site as directed	Per cu. yd.
(10)	Pier and column footing excavation, and excavation for pits, removed from site	Per cu. yd.
(11)	Excavation for grade beams, left on site as directed	Per cu. yd.
(12)	Excavation for grade beams, removed from site	Per cu. yd.
(13)	Backfill due to changed elevation	Per cu. yd.
(14)	Column forms, including stripping	Per sq. ft.
(15)	Beam forms, including stripping	Per sq. ft.
(16)	Wall forms, including stripping	Per sq. ft.

(17)	Footing forms, including stripping	Per sq. ft.
(18)	Reinforcing steel, in place, including accessories	Per pound
(19)	Structural concrete, in place, not including forms or reinforcement:	
	(a) 2500 psi	Per cu. yd.
(20)	Masonry foundation walls, in place	
	(a) 4 inch brick with 8" concrete block backcap	Per sq. ft.
	(b) 12 inch brick	Per sq. ft.
	(c) 12 inch concrete block	Per sq. ft.
(21)	Sheathing banks, material installed and removed	Per sq. ft.
(22)	Sheathing banks, material installed and left in place	Per sq. ft.

9. LIST OF OPTIONS

a. Permissible options with respect to the items shown are set forth in the list following and shall be at the option of the bidder wherever applicable to the work included in his bid, whether such bid be for prime or for subcontract work.

b. The permissible options listed in this Section, once they are selected and the Local Authority notified, shall become fixed parts of the respective contracts or subcontracts, and must be used throughout the entire Contract work subject to change only by written order of the Local Authority in the manner provided in the General Conditions for "Changes in the Work", and if such change be made at the Contractor's request, with no change in Contract time and no increase in the Contract price.

c. Where, on the Drawings or in the Specifications, acceptability of optional materials or methods is indicated for items not included in the list following, it shall be the privilege of a contractor or subcontractor to utilize those which best suit his purpose in the performance of his work. As to these options there must be uniformity within each building.

d. In exercising the options chosen from the list following, the Contractor or subcontractor shall assume all the responsibilities for his selections which he otherwise assumes under his Contract or subcontract for materials and methods prescribed thereunder without options, particularly with respect to securing timely deliveries, the passing of required tests, the adequacy of methods for the purposes for which intended, and the proper adaption to adjoining work so as to fit and coordinate therewith in an acceptable manner without extra cost.

e. List of Options:

Name of Item	Specified Under Division	Option
1. Foundation Walls	5	Brick or concrete block

10. EQUIPMENT FURNISHED BY OTHERS

a. The following equipment will be furnished by others but installed by the Contractor:

Cooking Ranges
Refrigerators
Movable Equipment for Job Offices of the Local Authority, Architect, and PHA

b. This equipment will be delivered to the Contractor at the transportation terminal serving the Project, or other local point, from which place or places the Contractor shall, at his expense and risk, unload the equipment and install it, including any necessary hauling to the places for installation. The Contractor shall provide and pay for any storage that may become necessary after delivery to him and shall assume all costs and risks incident thereto, and shall be responsible for any demurrage charge arising from his failure to unload promptly.

c. Where the type of equipment requires roughing-in dimensions, the Local Authority will furnish these to the Contractor as soon as obtainable.

d. When equipment arrives at the delivery point, the Contractor shall cause its prompt unloading and transfer to the Project site, unless otherwise permitted or directed. The unloading at delivery point shall not be performed except in the presence of a representative of the Local Authority with whom

the Contractor shall jointly determine what, if any, damage has occurred in transit, and the responsibility therefor. Turnover of the equipment to the Contractor shall then be formalized by means of a Transfer Receipt, executed in triplicate, signed by the representative both of the Contractor and the Local Authority, the latter retaining two copies. This document shall show all particulars of the shipment it covers, the number and condition of the items turned over to the Contractor, and the disposition of those found unusable.

e. Immediately after the inspection at delivery point for damage in transit has been completed the Contractor shall assume full responsibility for such equipment until such time or times as it is installed and accepted.

f. The Contractor shall inspect all equipment items for latent defects or concealed damage and for shortages, immediately upon its arrival at the Project site, or at place of storage, as the case may be. All such discrepancies shall be reported to the Local Authority not later than three days (exclusive of Saturdays, Sundays, and legal holidays) after the initial inspection described in 10d above.

g. The Local Authority will handle all claims against transportation companies for damage in transit and will furnish to the Contractor, as soon as practicable, replacements for any whole items so damaged and rejected as unfit for use.

h. The provision to "install" as used in Section 10b above, shall mean to cover all operations in connection with this equipment necessary to: (1) receive at the Project Site; (2) unload there; (3) distribute; (4) uncrate; (5) assemble as may be necessary; (6) place in permanent positions; (7) connect up; (8) clean up and dispose of rubbish.

i. The Contractor shall deliver all such equipment in whole and satisfactory operating condition, except that the final testing, adjusting, and checking for proper performance of gas-fired equipment, if used, will be done by others after the Contractor has performed all other required operations in connection therewith.

11. WORK BY OTHERS

The following work will be done by others:

a. At no expense to the Contractor:

(1) On site:

(a) Electrical Distribution and yard lighting systems, including furnishing and installing house meters.

(b) The Gas Distribution System up to the meters and including the furnishing and installation of the gas meters.

(c) Furnishing and installing Fire Hydrants including mains and valves in connection therewith, whether shown on or off the site.

(d) Removal of existing city water main shown to be relocated from the present Newton Street Right of way and re-installing in the new Newton Street location.

(2) Off Site: Refer to the drawings for lines located at the inside edge of sidewalks adjacent to boundary and intersecting city streets and which lines are noted as indicating limit of work. Work shown beyond these lines and as more specifically set forth hereinafter will be constructed by the City of Athens, Georgia, without cost to the Contractor except as may be specifically indicated on the drawings or specified included in the contract.

(a) Boundary and Intersecting Streets: Finley, Baxter, Newton (relocated) and Waddell Streets. Work where shown outside the Limit of Work Lines at boundary City Streets and to be done by others includes clearing, excavation, grading, and all costs in connection with construction of sidewalks and curbs and gutters of boundary streets, paving of boundary streets including parking strips adjacent to boundary streets and breaking out existing curb to form such parking strips, access aprons to Project streets and drive and including breaking out existing curbs where applicable and forming radial curbs up to the limit of work line where shown, constructing new utility lines including the relaying of the existing water line in Newton St. to be removed by the City of Athens, Georgia from its existing location, except that the connecting of project utility and drainage lines to be installed by the contractor to the new and existing lines and structures shown outside the limit of work line will be a part of the contract.

b. The contractor will perform all work and bear all expense in connection with extending utility and drainage lines to be constructed by him within the project and making connections as shown to new and existing city drainage and utility lines and structures even though the construction is outside the lines designating the limit of work by the contractor, and where the drawings show connections to be made to new manholes to be constructed in existing lines, the construction of such manholes shall be included in the contract.

c. The contractor will perform all work and bear all expense in connection with spreading of topsoil, finish grading and grassing of strips between sidewalks and curbs adjacent to boundary and intersecting streets, even though lying outside the indicated limit of work.

12. PARTIAL OCCUPANCY

The Local Authority, at its election, may from time to time occupy any of the dwelling units, buildings, or other portions of the Project as the work in connection therewith is completed to such a degree as will, in the opinion of the Local Authority, permit the use of the dwelling units, buildings, or other portions of the Project for the purpose for which intended. The Local Authority will, prior to any such partial occupancy, give notice to the Contractor thereof, and such occupancy shall be upon the following terms:

a. The one year guarantee period called for in Section 48 of the General Conditions shall not begin to run until the final acceptance of all work under the Contract.

b. The occupancy or use of any space in the Project shall not constitute an acceptance of work not performed in accordance with the Contract or relieve the Contractor of liability to perform any work required by the Contract but not completed at the time of said occupancy.

c. The Contractor shall be relieved of all maintenance costs on the buildings occupied under this agreement.

d. The Contractor shall not be responsible for wear and tear or damage resulting from said occupancy.

e. The Local Authority shall assume risk of loss with respect to any building occupied by it under the terms of this agreement; Provided, the Contractor shall assume full responsibility for loss or damage traceable to his fault or negligence in the performance of his Contract.

f. The Contractor shall not be required to furnish heat, light, power, and water used in the buildings occupied without proper remuneration therefor.

13. DISCRIMINATION

For the purpose of determing whether there has been discrimination in regard to Negro labor in violation of the provision contained in the General Conditions, titled "Qualifications for Employment", it is hereby provided that if the Contractor pays to the Negro skilled labor at least 10 % of the total amount paid in any period of four weeks for all skilled labor under the Contract (irrespective of individual trades), and pays Negro unskilled labor at least 60 % of the total amount paid in any period of four weeks for all unskilled labor under the Contract, it shall be considered as prima facie evidence that the Contractor has not discriminated against Negro labor.

14. DRAWINGS AND SPECIFICATIONS

The Local Authority will furnish the Contractor without charge 25 copies of the Drawings and Specifications. Additional copies requested by the Contractor will be furnished at cost.

15. RETENTION FOR LAWNS AND PLANTING

Upon the completion and acceptance of the construction work other than lawns and planting, there shall be withheld from the Contractor the sum of $_____ to cover the cost of lawns and planting work. Periodic payments, less 20%, will be made as the work progresses, on presentation of evidence that the Contractor has paid the lawns and planting subcontractor. Upon acceptance of such work, the Local Authority shall determine the amount needed to be withheld to assure performance of the guaranty in the Specifications, and the remainder shall be paid the Contractor, provided he has supplied the release required under Section 9d of the General Conditions.

16. RELEASE OF BUILDINGS

The entire area will be released to the Contractor for demolition purposes at one time under the Notice to Proceed, whereupon the Contractor shall have full control of the progress and sequence of the demolition, removal and clearing work, subject to all contract stipulations and covenants.

FORM OF UNIT PRICE AGREEMENT

UNIT PRICE AGREEMENT

(Name of Contractor _____, hereinafter called the "Contractor", and (Name of Local Authority) _____, hereinafter called the "Local Authority", do mutually understand and agree, pursuant to Section _____, "Unit Prices", of the "Special Conditions" of the Specifications dated _____ 19___, for (exact title of specifications) (project number) _____, that, as a condition of award to the Contractor for _____, of said Project, the following-listed unit prices shall be used, where applicable, to determine the equitable adjustment of the contract price in connection with changes or extra work ordered under the contract, and that the "Rules of Measurement" set forth in said Section _____ of the said "Special Conditions" shall govern.

It is further mutually understood and agreed that such unit prices include all items of cost, overhead and profit and that they constitute complete reimbursement to the Contractor for additional work or to the Local Authority for work omitted, as the case may be.

(List of items and prices)

The Housing Authority of
The City of Athens, Ga.

By _____

_____
(Title)

Date _____

CONTRACTOR

(NAME OF CONTRACTOR) _____

By _____

_____
(Title)

Date _____

SCHEDULE OF DRAWINGS

DATED: 23 AUGUST 1957

DWG. NO.	TITLE
	PROPERTY SURVEY MAPS
X-1	Property Line Map, Plan No. P.L.M. - Project Ga. 3-3
X-2	Topographic & Utility Map, Plan No. T & UM "A" - Project Ga. 3-3
X-3	Topographic & Utility Map, Plan No. T & UM "B" - Project Ga. 3-3
X-4	Topographic & Utility Map, Plan No. T & U M "C" - Project Ga. 3-3
X-5	Topographic & Utility Map, Plan No. T & UM "D" - Project Ga. 3-3
	SITE DEVELOPMENT
S-1	General Site Plan - Project Ga. 3-3
S-2	Layout & Site Work: Block "A" - Project Ga. 3-3
S-3	Layout & Site Work: Block "B" - Project Ga. 3-3
S-4	Layout & Site Work: Blocks "C" & "D" - Project Ga. 3-3
S-5	Retaining Walls: Elevations & Sections
S-6	Street Profiles
S-7	Street Profiles
	ARCHITECTURAL
A-1	Floor Plans: Units Type "A" & "B" & Schedules
A-2	Floor Plan: Unit Type "C"
A-3	Floor Plan: Unit Type "C" Split Level
A-4	Floor Plans: Units Type "E" & "F"
A-5	Floor Plan & Elevations, Unit Type "G"
A-6	Floor Plan & Elevations, Type "E", Split Level
A-7	Elevations, Types "A" & "B"
A-8	Elevations, Type "C"
A-9	Elevations, Type "C", Split Level
A-10	Elevations, Types "E" & "F"
A-11	Typical Cross Section & Framing Plans, Types "A","B","C"
A-12	Framing Plans, Types "E", "F" & "G"
A-13	Door & Window Details & Porch Partition
A-14	Kitchen Details, Bath Elevations & Misc. Details
A-15	Closet Details
A-16	M & M Building: Floor Plan, Framing Plan & Sections
A-17	M & M Building: Elevations & Details
A-18	Strip Elevations: Buildings 1 thru 5
A-19	Strip Elevations: Buildings 6 thru 10
A-20	Strip Elevations: Buildings 11 thru 15
A-21	Strip Elevations: Buildings 16 thru 23
A-22	Strip Elevations: Buildings 24 thru 30

SCHEDULE OF DRAWINGS

DWG. NO.	TITLE
	MECHANICAL
M-1	Dwelling Buildings: Plumbing & Heating
M-2	Dwelling Buildings: Plumbing & Heating
M-3	Dwelling Buildings: Plumbing & Heating
M-4	Dwelling Buildings: Plumbing & Heating
M-5	Dwelling Buildings: Plumbing & Heating
M-6	M & M Building: Plumbing & Heating
E-1	Dwelling Buildings: Electrical
E-2	Dwelling Buildings: Electrical
E-3	Dwelling Buildings: Electrical
E-4	Dwelling Buildings: Electrical
E-5	M & M Building: Electrical
	UTILITIES
U-1	Details: Sewer, Drainage, Pavement & Sidewalk
U-2	Utility Plan: Block "A"
U-3	Utility Plan: Block "B"
U-4	Utility Plan: Blocks "C" & "D"
U-5	Sanitary Sewer Profile
	LANDSCAPE
L-1	Landscape Plan: Block "A"
L-2	Landscape Plan: Block "B"
L-3	Landscape Plan: Blocks "C" & "D"

DIVISION 1

DEMOLITION AND CLEARING OF SITE

1. SCOPE

This division includes the demolition and removal of buildings, sheds, fences, steps and other structures from the project site. Existing rubbish, trash and junk apart from that of demolished buildings shall be removed and the site left clear of such materials. Except as otherwise shown or stipulated, the demolition work here specified shall be carried down to existing ground level. The required demolition and removal of construction below existing ground level is covered by the division EXCAVATING, FILLING AND GRADING.

2. NOTICE TO PROCEED

(See Section, RELEASE OF BUILDINGS, SPECIAL CONDITIONS)

3. TITLE TO BUILDINGS AND STRUCTURES

(See Section, REMOVAL AND SALVAGE OF EXISTING BUILDINGS, GENERAL CONDITIONS.)

4. RODENT EXTERMINATION

Before commencing demolition work, carry out through an experienced subcontractor effective measures for rodent extermination over the entire site. The method of extermination employed shall be one in successful local use, and shall meet the approval of the local health department. Upon completion of the extermination work, present to the Local Authority, a certificate from the health department stating that the work has been performed satisfactorily.

5. UTILITIES

a. Disconnection. Before starting demolition, disconnect, or arrange for the disconnection of utility service connections, such as water, gas, steam, electricity and telephone, to buildings to be demolished, in accordance with the regulations of the utility concerned. Seal storm and sanitary sewers leading from structures to be demolished. (See also Section PERMITS AND CODES, and Section, CARE OF WORK, GENERAL CONDITIONS.)

b. Protection. Preserve in operating condition all active utilities traversing the project site; protect all property, including but not limited to, mains, manholes, catch basins, valve boxes, poles, guys and other appurtenances. Repair damage to any such utility, due to work under this contract, to the satisfaction of the Local Authority.

6. DEMOLITION AND REMOVAL

a. Extent. Except as otherwise shown or specified, demolish structures and foundations to existing ground level; remove completely steps, posts, porches, and similar construction.

b. Provide adequate protection to persons and property. Execute the work in such a manner so as to avoid interference with the use of or passage to and from adjoining buildings and facilities.

c. Trees. Before starting demolition, fence all trees, or groups of trees, designated on the drawings as to remain, to the outer limits of the spread of branches. Such fenced areas shall not be used for storage of building materials or for any purpose likely to damage tree roots or branches.

d. Demolition on Premises. Demolish masonry walls in small sections. Remove structural steel, cast iron and heavy timbers by individual pieces and lower carefully. Remove, regardless of elevation, floor construction over basements and cellars. Remove partitions (except masonry cross-walls), stairways, furnaces, piping, apparatur and debris from within existing basements. Break up basement and cellar floors sufficiently to permit drainage. (See also, Section, REMOVAL AND SALVAGE OF EXISTING BUILDINGS, GENERAL CONDITIONS.)

e. Dust Control. Wet down thoroughly masonry walls during demolition to prevent spread of dust; provide water and necessary connections therefor.

f. Use of Explosives. Do no blasting on the project site except after written permission from the Local Authority and in the manner prescribed by local regulations.

g. Fires. Burn no materials or debris on the premises without specific permission, and not under or near trees to remain.

h. Salvage for Local Authority. No salvage material is reserved for use by the Local Authority.

i. Clean-up. Remove from the site rubbish and debris found thereon and, except as otherwise specified, materials and debris resulting from the work of demolition; leave the site in safe and clean condition. Storage of materials resulting from demolition and/or of tools and equipment, relating thereto on the site will not be permitted after completion of this demolition and removal work.

DIVISION 2

EXCAVATING, FILLING AND GRADING

1. SCOPE

This Division includes excavating, filling, grading, and related items required to complete the work indicated on the drawings and specified, except:

(1) excavation and backfill for utilities, specified in the Division UTILITIES (SEWERS, WATER AND GAS);

(2) placing of topsoil and required excavation in connection with planting, specified in the Division LAWNS AND PLANTING; and

(3) excavation and backfill in connection with plumbing, which is specified in the Division PLUMBING.

2. SUBSURFACE SOIL DATA

Subsurface investigations have been made and the results shown on the drawings. The information was obtained primarily for use in preparing the foundation design, but the Contractor may draw his own conclusions there from. No responsibility is assumed by the Local Authority for subsoil quality or conditions other than at the locations, and at the time, the exploration was made. No claim for extra compensation, or for extension of time, will be allowed on account of subsurface conditions inconsistent with the data shown, except as provided elsewhere herein.

3. BENCH MARKS AND MONUMENTS

Maintain carefully all bench marks, monuments, and other reference points; if disturbed or destroyed, replace as directed.

4. FINISHED GRADES

The words, "finished grades", as used herein, mean the required final grade elevations indicated on the drawings. Should finished grades shown by spot elevations conflict with those shown by contours, the spot elevations shall govern. Where not otherwise indicated, project site areas outside of buildings shall be given uniform slopes between points for which finished grades are shown, or between such points and existing grade, except that vertical curves or roundings shall be provided at abrupt changes in slope.

5. TREES

a. Trees to Remain. Protect trees which are to remain, as so indicated on the drawings or as further directed by the Local Authority, by the erection of suitable temporary fences, by boxing, or other suitable means, to the extent, if any, that such protection has not been provided under the requirements of the Division, DEMOLITION AND CLEARING OF SITE. Remove dead or interfering branches as directed, without injury to trunks; paint-treat scars immediately. Perform no excavation or grading within the spread of branches except as necessitated by building and surfacing construction and utility trenching. Light no fires under or near any tree to remain and place no materials, or debris, nor park any equipment, motordriven or otherwise, within the spread of branches.

b. Trees to be Removed. Remove all trees and shrubs, except those designated to remain, from the project site. Cut trees and stumps in areas to be filled as close to the ground as practicable but not to exceed 12 inches therefrom. Fell trees in such way as not to injure trees to remain. Remove completely stumps and roots from areas to be occupied by buildings and for a distance of 5 feet outside of building walls. Remove all other stumps and roots to a clear depth of not less than 2 feet below subgrade level. All material resulting from the clearing and grubbing here specified shall become the property of the Contractor and shall be disposed of by him. Burn no material on the premises without special permission from the Local Authority and in compliance with applicable laws and regulations.

6. STRIPPING OF TOPSOIL

Because suitable topsoil is not available at the site, approximately 3700 cubic yards of topsoil shall be furnished from off the site and spread as specified under Division LAWNS AND PLANTING. Refer to that Division for characteristics of top soil to be furnished. Top soil in quantity above referred to shall be furnished by the contractor without expense to the Local Authority, and which top soil shall be delivered to the site only after inspection by the Local Authority of the top soil in its original undisturbed location and after approval of samples as complying with characteristics described under Division "LAWNS AND PLANTING" for top soil to be furnished.

7. EXCAVATING

a. Grades, Dimensions. For buildings, excavate to elevations and dimensions indicated, plus ample space for

construction operations and inspection of foundation. Footings and foundations must rest on undisturbed and firm bottoms, free from loose material; fill with concrete any excess cut under footings and foundations. Outside of buildings, excavate where and as necessary to obtain grade elevations as shown on the drawings and hereinafter specified.

b. Obstructions. Remove entirely all existing walls, floors, footings, piers, and other construction from the locations of new footings and foundations; elsewhere within the lines of new buildings, remove such obstructions to a depth of 6 inches below required grade as shown on the drawings. Outside of the areas of building excavation, within the project site, remove to a minimum depth of 2 feet below finished grade all existing walls, floors, curbs, pavements, and other improvements unless shown to be retained in the project. Clean out any existing dug wells, cisterns, abandoned manholes, catch basins, and other similar structures, and fill with granular material firmly compacted. Plug with concrete or masonry the open ends of abandoned sewers encountered in any excavation; plug in the same manner sewer openings in abandoned manholes and catch basins. Break up masonry or concrete bottoms of existing structures to permit drainage.

c. Rock Excavation. The term "rock" as used herein is defined to be hard material, as found in nature, that cannot be dislodged from its bed and removed therefrom without blasting or drilling; anything other is "earth" in so far as removal of the material to be excavated is concerned; also removal of paving and paving foundations is not classified as rock removal. If "rock" is encountered in the excavation hereunder and otherwise within the limits of work under this contract, the Contract Price will be adjusted. (See GENERAL CONDITIONS and SPECIAL CONDITIONS.)

(1) Rock Excavation for Foundations. All rock bottoms for foundations shall be carefully examined; loose or shaken rock shall be removed to solid bearing, and the rock surface levelled or shelved to a slope not exceeding one inch per foot, or as directed.

(2) Rock Excavation Outside of Buildings. Excavate rock encountered in grading the areas outside of buildings to depths as follows: under surfaced areas, to 6 inches below the required subgrade for such areas; under lawn and planting areas, to 12 inches below finished grade, provided that boulders or rock outcrops shall be left undisturbed if the

drawings so indicate or the Local Authority so directs. Such areas of rock excavation shall be backfilled to subgrade level with suitable earth (all topsoil in lawn and planting areas) thoroughly compacted in place.

(3) Blasting. Obtain written approval of method from the Local Authority before proceeding with rock excavation. Explosives shall be stored, handled and employed in accordance with local regulations or, in the absence of such, in accordance with the provisions of the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Inc.

d. Should latent soil or other conditions require changes, the "Contract Price" shall be adjusted. (See "GENERAL CONDITIONS".)

e. Shore, sheet and/or, brace excavations as required to maintain them secure; remove shoring as the backfilling progresses, but only when banks are safe against caving. Such shoring shall not constitute a condition for which any increase may be made in the Contract Price except that when sheeting is left in place on written order of the Local Authority, the Contract Price will be adjusted.

f. Drainage. Keep excavations free from water. Do not discharge water from excavations onto privately owned property nor where harmful erosion will result. Presence of ground water in the soil shall not constitute a condition for which any increase may be made in the Contract Price.

g. Frost Protection. Make no excavations to the full depth indicated when freezing temperature may be expected, unless the footings or slabs can be poured immediately after the excavation has been completed. Protect the bottoms so excavated from frost if placing of concrete is delayed.

h. Disposal. Remove from the site, and dispose of, all debris and all excavated materials not suitable or needed for fill.

i. Insanitary conditions encountered shall be corrected or removed entirely.

8. BACKFILLING, FILLING, AND GRADING

a. Grades. Do all cutting, filling, backfilling, and grading required to bring the entire project area, outside of buildings, to subgrades as follows:

(1) Within Building Areas to the underside of gravel fill under concrete floor slabs as shown required for the earth sub grade by the building plans.

(2) For surfaced areas, including roadways, parking areas, walks, recreation areas, sitting areas, and drying yards, to the underside of the respective surfacing, as fixed by the finished grades therefor.

(3) For lawn and planted areas, to 3 inches below finished grade. Unless otherwise shown on the drawings, slope the subgrade evenly to provide drainage away from building walls in all directions at a grade of 1/4 inch per foot minimum for at least 10 feet from the building walls. Drainage swales shall have a minimum flow-line grade of not less than 1/8 inch per foot. Provide roundings at top and bottom of banks and at other breaks in grade.

b. Backfill against Foundation Walls. Remove from spaces to be filled all unsuitable material, including all rubbish, trash, refuse and other debris. Place no backfill until foundation walls are braced and have cured sufficiently to develop the strength necessary to withstand, without damage, the pressures that will result from backfilling and compacting operations. Secure approval of the Local Authority before commencing this work. Material for this backfill shall be clean and unfrozen, free from substance subject to rot, corrosion, termite attack, or from metallic scrap or other deleterious material. It may contain masonry or rock fragments not more than 6" in maximum dimension provided none are placed closer than 24" to wall surface or to finished grade. If fill is required on both sides of a wall it shall be brought up simultaneously and evenly on both sides. Backfilling around piping shall be by hand and for a depth of one foot above the pipe, taking care not to disturb the pipe or injure pipe coating. Place all fill in horizontal layers not more than 6" deep, measured loose, and compact each layer thoroughly with mechanical tampers before placing the next layer. Work shall be at once discontinued if damage to dampproofing, waterproofing, piping or other construction occurs, and such damage shall be satisfactorily repaired before work is resumed. Bring backfill to required grades.

c. Filling

(1) Preparation of Fill Areas. Strip vegetation from areas to be filled and remove therefrom all debris subject to termite attack, rot or corrosion. Fill holes and minor depressions and compact such filling thoroughly. On sloped ground surfaces steeper than 1 to 4 on which embankment is to be placed, plow deeply or cut steps in existing ground surface before starting filling operation.

(2) Fill material shall be free from debris, perishable or combustible material, sod, frozen earth, and stones larger than 6 inches in maximum dimension. Rock or broken masonry shall be well distributed in earth or other fine material, with interstices filled, and shall not be placed within 2 feet of finished grade, nor in fill under concrete building floor slabs.

(3) Compaction. Place fill material in uniform, approximately horizontal layers, not more than 8 inches thick measured loose, over the full area involved. Moisten each layer if and as necessary to insure good bonding and maximum compaction by rolling as below specified; work the surface with suitable equipment to mix the fill materials and secure uniform moisture content. Compact each layer fully and uniformly by rolling with an approved tamping or three wheeled power roller, or pneumatic-tired roller, whichever is best suited to the type of soil encountered, until thoroughly compacted to not less than 95 percent maximum density obtained at optimum moisture for sub grade areas under pavements and buildings, and 92 percent of maximum density obtained at optimum moisture for other graded areas. Compact top layer with a smooth-wheel roller weighing not less than 10 tons, continuing such rolling until there is no creeping ahead of the roller. In locations where it is impracticable to use the equipment just specified, compact the fill thoroughly by moistening and mechanical tamping.

(a) Except as otherwise specified the degree of compaction and density for embankments and sub grade shall be determined and controlled in accordance with the requirements of American Association of State Highway Official specification No. T-99-49 Standard Method of Test for the Compaction and Density of Soil, with the following modifications:

1. The weight of the rammer or metal tamper shall be 10 lbs. instead of $5\frac{1}{2}$ pounds.

2. The tamper shall be dropped from a height of 18 inches above the sample instead of 12 inches.

3. The sample shall be compacted in five layers, each approximately one inch thick.

Costs in connection with compaction tests shall be at the expense of the Local Authority.

d. Deficiency of Fill Material. Provide clean, suitable earth for requisite additional fill if a sufficient quantity of suitable material therefor is not available from the required excavation on the site.

e. Correction of Subgrade. Bring to required subgrade levels any areas where settlement, erosion or other grade changes occur.

9. DISPOSITION OF UTILITIES

a. Rules and regulations governing the respective utilities shall be observed in executing all work under this heading.

b. Active utilities shown on the drawings shall be adequately protected from damage, and removed or relocated only as indicated or specified.

c. Active utilities not shown on the drawings shall be protected or relocated in accordance with written instructions of the Local Authority, and the Contract Price will be adjusted for such additional work. (See "General Conditions".)

d. Inactive and abandoned utilities encountered in excavating and grading operations shall be removed, plugged, or capped. In absence of specific requirements, plug or cap such utility lines at least 3 feet outside of new building walls or as required by the local regulations.

10. GENERAL

Complete the grading operations after buildings have been finished, utilities installed, site improvements constructed, and all materials, rubbish, and debris removed from the site. Leave subgrade for lawns and planted areas clean and at required grades.

DIVISION 3

TERMITE CONTROL TREATMENT

1. SCOPE

The compacted soil under all concrete floor slabs, including porch floor slabs, shall be chemically treated before gravel fill or vapor barrier is placed.

2. MATERIALS

One of the following chemicals and concentration in water solution shall be used:

a. Benzene Hexachloride gamma isomer 0.8 per cent
b. Chlordane 1.0 per cent
c. Dieldrin 0.3 per cent
d. Proprietary materials if (1) they meet a five-year field test conducted by the U. S. Forest Service, (2) they contain one or more of the above-named chemicals in the concentrations given, (3) proof is provided that no toxic effects to humans or beneficial plant and animal life will result from their use.

3. RATES OF APPLICATION

Apply one gallon per 10 square feet as an over-all treatment under the slab and, in addition, apply 2 gallons per 5 linear feet along the inside of foundation walls and around any opening in the interior of the slab cut or left for pipes, conduits, or interior partitions.

4. APPLICATION TECHNIQUE

Treatment shall not be made when the soil is excessively wet or immediately after heavy rains to avoid surface flow of the toxicant from the application site.

Unless the treated soil is to be promptly covered with stone fill and vapor barrier, adequate precautions must be taken to prevent disturbance of the treatment and human or animal contact with the treated soil.

DIVISION 4

CONCRETE

1. SCOPE

This division includes concrete and related items required to complete the work indicated on the drawings and specified, except the concrete work which is specified in the divisions HEATING, PLUMBING, ELECTRICAL, SITE IMPROVEMENTS AND UTILITIES.

2. MATERIALS

a. Portland Cement shall conform to A.S.T.M. "Standard Specifications for Portland Cement", C150-47, Type I.

b. High-Early-Strength portland cement shall conform to A.S.T.M."Standard Specifications for Portland Cement", C150-47, Type III.

c. Aggregates for concrete shall conform to A.S.T.M. "Standard Specifications for Concrete Aggregates", C33-46.

(1) Fine aggregate shall be natural sand, or sand prepared from stone, blast furnace slab, or gravel or other inert materials having similar characteristics when given prior approval by the Local Authority.

(2) Coarse aggregate shall be crushed stone, gravel, blast furnace slag, or other approved inert materials of similar characteristics, or combinations thereof having hard, strong, durable pieces, free from adherent coatings. Maximum size of pieces shall be 1 inch, except for footings and foundation walls, which may be 1-1/2 inch maximum size.

d. Water shall be clean, and free from injurious amounts of oils, acid, alkalis, organic materials, or other deleterious substances.

e. Metal bar reinforcement shall be deformed, conforming to ASTM A-305 and to one of the following requirements:

(1) A.S.T.M. "Standard Specifications for Billet-Steel Bars for Concrete Reinforcement", A15-46.

(2) A.S.T.M. "Standard Specifications for Rail - Steel Bars for Concrete Reinforcement", A16-46.

(3) A.S.T.M. "Standard Specifications for Axle - Steel Bars for Concrete Reinforcement", A160-46.

f. Steel mesh reinforcement shall conform to:

(1) A.S.T.M. "Standard Specifications for Cold - Drawn Steel Wire for Concrete Reinforcement", A82-46.

(2) A.S.T.M. "Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement", A185 - 46.

g. Metal Accessories, including spacers, chairs, ties and other devices necessary for properly assembling, placing, spacing and supporting all reinforcement in place, shall be provided. Legs of accessories resting on beam forms shall be coated after fabrication to avoid rust spots.

h. Vapor Barrier over sub grade and gravel fill below floor slabs shall be 55 pound smooth roofing or polyethylene film of 4-mil minimum thickness.

3. TESTING AND INSPECTION

Testing and inspection of concrete and materials shall be made under the direction of the Local Authority, who shall have access to all places where concrete materials are stored, proportioned, mixed, or placed.

a. Mill, laboratory tests reports and affidavits shall be furnished by the manufacturer, certifying that all materials delivered to the project conform to these specifications, when requested by the Local Authority.

b. Test cylinders. The contractor shall furnish on each day concrete is poured two test cylinders of concrete and if more than fifty cubic yards is poured he will furnish two test cylinders of concrete for each additional fifty cubic yards of concrete or fraction thereof poured in any one day. All costs in connection with making, crating, shipping and testing of the cylinders for the strengths specified by the methods described in A.S.T.M. Standard C 39-44 by a recognized testing Laboratory approved by the Local Authority, shall be at the contractor's expense.

(1) The Local Authority shall have the right to require the furnishing of additional test specimens, for which the cost of crating, shipping and testing shall be at the expense of the Local Authority if specified strengths are obtained for such additional specimens, otherwise the costs in connection with such additional cylinders shall be at the expense of the Contractor.

(2) For portions of the work in place where concrete of an indicated deficient strength as indicated by test reports on cylinders taken at the time of pouring as above specified has been used, the Local Authority may obtain specimens of concrete in accordance with method prescribed in A.S.T.M. Standard C 42-44 and tested in accordance with A.S.T.M. Standard C39-44. Should such specimens fail to develop the minimum strengths specified, the faulty concrete shall be replaced. The obtaining of specimens and testing of the specimens shall be done at the contractor's expense.

4. STORAGE OF MATERIALS

Cement and aggregates shall be stored in a manner that prevents deterioration or intrusion of foreign matter. Any material which has deteriorated or has been damaged shall not be used for concrete.

5. PROPORTIONING AND MIXING CAST-IN-PLACE CONCRETE

a. All concrete shall be Class "B", having a minimum 28 day compressive strength of 2500 pounds per square inch. Strength tests shall be made by the methods described in A.S.T.M. Standard C 39-44.

b. Mix all concrete ingredients in power batch mixers, for not less than 1 minute after all ingredients are in power batch mixers having a capacity of 1 cubic yard or less. Increase mixing period 15 seconds for each 1/2 cubic yard additional capacity of the mixer.

c. Concrete Proportions and Consistency. Proportions of aggregate to cement for concrete shall be in accordance with a formula pre-established by an approved testing laboratory, at the expense of the contractor, and based on testing of actual samples of concrete composed of the cement and aggregates proposed by the contractor to be used in the construction, and to be such as to produce a mixture which will work readily into the corners and angles of forms and around reinforcement without permitting segregation of materials or an excess of free water collecting on the surface. The methods for measuring concrete materials shall be such that the proportions can be accurately controlled and easily checked during the progress of the work. Mixing water shall not exceed 7¼ gallons per sack of cement, including the free water in the aggregates.

(1) Job Mixed Concrete, Class "B", shall be composed of cement and aggregate and water in the proportions established for the approved design mix to provide a minimum 28 day compressive strength of 2500 pounds per square inch and mixed until there is a uniform distribution of the materials, and shall be discharged completely before the mixer is recharged.

(2) Ready Mix Concrete. Certificates shall be furnished by the mixing plant that the Class "B" concrete has a minimum 28 day compressive strength of 2500 lbs. per sq. in. established in advance by tests made in accordance with methods described in A.S.T.M. Standards C39-44 and C192-47T. No change shall be made in the materials or the established mix without prior approval from the Local Authority.

(3) Ready Dry Batched Mixes. Certificates shall be furnished for concrete strengths, prior testing, etc., similar to that required for ready mix concrete.

d. One brand of cement only shall be used on any one building unless written permission is given by the Local Authority.

6. FORMS

Forms shall conform to the shape, lines, and dimensions of members called for on plans, and shall be sufficiently substantial and tight to prevent leakage of mortar. They shall be properly braced or tied together to maintain their position and shape when concrete is tamped or vibrated. Provide 3/4" chamfer on exposed edges of lintels and beams.

a. Forms for footings may be omitted when the soil and workmanship permit accurate excavation to size; and the omission is approved by the Local Authority.

b. Removal of Forms shall be done in a manner which will assure complete safety of the structure. When the structure as a whole is supported on shores, the removable beam and girder sides, column and similar vertical forms may be removed after 24 hours, provided the concrete is sufficiently hard and will not be injured. In no case shall the supporting forms or shoring be removed until the members have acquired sufficient strength to support their weight and the loads thereon safely.

(1) Forms for permanently exposed surfaces shall produce a smooth, even, level, finish without fins or board marks.

7. REINFORCEMENT

a. Reinforcement shall be free from scale, rust, or coatings which will reduce the bond to the concrete.

b. Bars shall be accurately bent and placed as indicated on the drawings and securely supported and fastened to prevent movement during the placement of concrete.

c. Wire fabric used for reinforcing slabs on the ground shall have a minimum side and end lap of 4 inches.

d. Shop drawings shall be submitted to the Local Authority for approval. Make separate assembly plans for each building foundation, and for all work except identical floor and roof plans. Buildings of opposite hand shall have separate assembly diagrams.

8. FASTENING DEVICES AND OTHER WORK.

Install all inserts, anchors, and other fastening devices, required for the installation of other work.

a. Metal anchors or ties for securing masonry work to concrete walls, and beams shall be of non-corroding metal, wrought iron or steel zinc coated after fabrication, and approved by the Local Authority. Install the necessary metal slots or inserts in the concrete and provide at least one anchor for every 300 square inches of concrete surface or as detailed.

9. DEPOSITING CONCRETE

a. Soil Bottoms for footings and slabs shall be approved by the Local Authority before placing concrete. Foundations shall be carried to depths shown on the drawings, bearing on original soil or on embankment compacted to the density specified for compaction of soil under buildings (Division 2).

b. Remove water and all foreign matter from forms and excavations. Unless otherwise directed, wood forms and sand or sandy loam shall be thoroughly wetted just prior to placing concrete.

c. Deposit concrete as nearly as practicable in its final position to avoid segregation due to re-handling or flowing. Place no concrete until all reinforcing steel, pipes, conduits, sleeves, hangers, and other work required to be built into concrete have been inspected and approved by the Local Authority. Concrete shall be carefully worked around reinforcement and embedded fixtures, along surfaces and into the corners of forms. Vibrators may be used provided they are operated under experienced supervision and forms are strong enough to withstand their action.

d. Retempering. No concrete that has partially hardened, become contaminated by foreign materials, or been retempered, shall be used.

e. Construction Joints. Placing concrete shall generally be carried on as a continuous operation until the placing of an individual section is completed. When construction joints are necessary they shall be located near points of zero shear and as approved by the Local Authority.

f. Preparation of Surfaces. Before placing concrete against concrete that has hardened, the existing surface shall be picked, brushed clean and coated with neat cement grout for proper bond.

10. CONCRETE FLOOR SLABS ON GROUND

a. Solid Concrete Slabs on the Grade. Over the compacted sub grade provided under Division 2, EXCAVATION, FILLING AND GRADING, and after fine grading, place a 3 inch layer of crushed stone, slag, or gravel, graded from 3/4 to 1 1/2 inches. Level off and place a durable vapor barrier consisting of 55-pound smooth roofing with sealed, lapped joints or polyethylene film of 4-mil minimum thickness, over the entire slab area before placing concrete. Reinforce the 4-inch slab with No. 10 wire mesh, 6 inches center, both ways. The gravel fill will not be required under porch floor slabs.

11. CEMENT FLOOR FINISHES

Screed the entire surface of the concrete slab at proper level to receive finish. Remove surface water, laitance or dirt before applying specified finish. Finish floors, except as otherwise specified, with a minimum of steel trowelling to produce a smooth surface, free from blemishes, and true to a maximum tolerance of 1/8 inch in 6 feet.

a. Type I Monolithic Finish. For all cement finished floors, porches, steps and platforms, not otherwise specified and for all slabs which are to be covered with asphalt or ceramic tile, the floor slab shall be finished by screeding, floating and trowelling. A dry mix of 1 part cement and 2 parts fine aggregate may be spread on the moist slab as required to accelerate the floating and steel trowelling operations.

b. Type II Non-Monolithic Finish. When the cement finishing cannot be applied to the structural slab until after it has set, clean surface of the slab, remove laitance and loose particles, and roughen the surface to insure a complete bond between the slab and finish. Screed slab with a cement grout and then apply the following finish using a mix composed of 1 part cement, 1 part fine aggregate and 1½ to 2 parts of coarse aggregate (1/8" to 3/8"). This may be varied but in no event shall the coarse aggregate be less than 1½ times the volume of the fine aggregate. Mechanically mix for not less than 1½

minutes after all ingredients are in the mixer, using not more than 5 gallons of water, including free water in aggregates, for each sack of cement. Spread evenly over the moistened structural slab to a depth not less than 1/2", strike off, compact by wood floating, and finish with steel trowel. Delay finishing until concrete has hardened sufficiently to prevent excess water or fine aggregate working to the surface with trowelling.

12. CURING

Protect all concrete work and cement finishes against injury from the elements and defacement of any nature during construction operations. All concrete made with normal portland cement shall be maintained in a moist condition for at least the first seven days and after placing a high-early strength concrete for at least the first three days. One of the following methods shall be used for curing unless another equally efficient method is approved by the Local Authority,

a. Burlap Cover. Keep the slab wet by light sprinkling for the first 12 hours and then cover with two layers of burlap kept continuously wet for the balance of the curing period.

b. Paper Cover. Immediately following an initial 12-hour sprinkling period, the surface shall be covered with a strong kraft waterproof paper (Federal Specification UU-P-147, Type IV, class C), with perimeter edges and laps carefully sealed with tape, and left in place for the balance of the curing period.

13. COLD WEATHER REQUIREMENTS

a. Adequate equipment shall be provided for heating the concrete materials and protecting the concrete during freezing or near freezing weather. Concrete materials and reinforcement, forms, fillers, and ground with which the concrete is to come in contact, shall be free from frost. When the temperature of the surrounding air is below 40 degrees F., concrete shall have a temperature of between 60 degrees F. and 90 degrees F. when placed in the forms and shall be maintained at a temperature of not less than 50 degrees F. for at least 72 hours for normal portland cement concrete, 24 hours for high-early-strength concrete, or for as much more time as is necessary to insure a proper rate of curing of the concrete. The covering protection used in connection with curing shall remain in place and intact, at least 24 hours after artificial heating is discontinued.

14. CLEANING

a. Clean all exposed concrete surfaces and all adjoining work stained by the leakage of concrete, to meet the approval of the Local Authority.

b. Surface defects which do not impair the structural strength shall be carefully cut out and refilled with fresh concrete. Cuts shall not be less than one inch deep, and thoroughly wetted just prior to filling with concrete of stiff consistency and of a mix approximately the same as the adjoining work. After a partial set, compress and rub to produce a finish similar in texture and color to adjoining work.

(1) Metal form ties, extending from the face of permanently exposed concrete shall be cut off at least 3/4 inch deep in the concrete immediately after removal of forms. Fill holes with a 1:3 cement and sand mortar approximately the same color as the adjoining concrete. Mix and place the mortar as dry as possible for finish flush with the adjacent surface, and where exposed to produce a finish similar in color and texture to the adjacent surface.

15. EXPANSION JOINT MATERIAL

Where interior concrete floor slabs abut masonry walls and at other points shown on the plans and specifications, furnish and install expansion joint filler the full depth of the concrete slab and 1/2 inch thick.

a. Joint material shall be a premolded rigid material of cellular nature conforming with Federal Specifications HH-F-334 or ASTM Standard Specifications for Preformed Expansion Joint filler for Concrete D544-49.

DIVISION 5

MASONRY

1. SCOPE

This Division includes masonry and related items required to complete the work indicated on the drawings and specified except Quarry Tile Stools which are specified under Division CERAMIC AND QUARRY TILE, Stone Sills specified under Division 5a, and masonry work not a part of the buildings which is specified in the Divisions UTILITIES (Sewers) and SITE IMPROVEMENTS. This Division also includes the building-in of appliances of other trades such as plates, anchors, bolts, ties, dowels, nailers, lintels, built in flashings, and miscellaneous items embedded in masonry. Refer to SPECIAL CONDITIONS, Section 9, List of Options, for optional foundation and bond for walls and partitions.

2. MATERIALS

Exterior walls shall be faced with masonry units manufactured for exterior work. Masonry units serving as a base for plaster shall have a surface sufficiently rough to provide a mechanical bond.

All materials shall conform to the following standard specifications listed opposite the material.

a. Mortar:

(1) Aggregates: A.S.T.M. C144-44

(2) Water shall be clean and free from injurious amounts of acids, alkalis, organic materials or other deleterious substances.

(3) Portland Cement: A.S.T.M. C150-47

(4) Masonry Cement: A.S.T.M. C91-49 Type II

(5) Natural Cement: A.S.T.M. C10-49T

(6) Hydrated Lime: A.S.T.M. C207-46T Type N or S

(7) Quicklime: A.S.T.M. C5-26

b. Brick (Clay or Shale): A.S.T.M. C62-50 Grade SW for masonry below grade and Grade SW or MW for masonry above grade, standard or modular size. In addition all exterior exposed brick above grade shall conform to the Tentative Specifications for Select Common Brick as prepared by the Southern Brick and Tile Manufacturers Association, Atlanta, Georgia, and shall be shipped packed in straw.

c. Brick (Sand Lime): A.S.T.M. C73-51 Grade SW

d. Concrete Masonry Units, Hollow Load Bearing: A.S.T.M. C90-44 (cinder aggregate will not be acceptable).

e. DELETED

f. Concrete Masonry Units, Solid: A.S.T.M. C145-40

g. Continuous Joint Reinforcement shall consist of two parallel wires of not less than No. 8 ASEW gage smooth or deformed wire with cross wire of not less than No. 12 ASEW gage wire welded to the lingitudinal wires. The cross wire shall be placed at intervals not exceeding 6 inches for smooth longitudinal wire and at intervals not exceeding 16 inches for deformed wire. The cross wire on smooth longitudinal wires shall be welded either above or below the longitudinal wires, but on deformed bars it may be placed in the same plane. Longitudinal wires shall be cold drawn steel, ASTM A-82 except tensile strength shall be not less than 100,000 psi. Joint reinforcement shall be flat, not coiled, and at splices shall lap at least 32 diameters, bent and lapped at corners. Material shall be galvanized or other non-corrosive finish.

h. Corrugated or Crimped Anchors shall be not less than 7/8" wide and not lighter than 22 gage (manufacturer's standard gage) and of length to suit masonry units where required.

i. Cavity Wall Anchors shall be 3/16 inch diameter corrosion resistant steel rod anchors having not less than 2 inch long lugs at each end, and of length to suit the wall thickness.

3. MORTARS

Mortar used in masonry construction shall be classified by the following minimum compressive strengths (psi) for 2 inch cubes at 28 days: Type S, 1800, Type N, 750, or shall be classified by proportion as shown in the table below.

a. Classification by Test: When it is desired to establish the strength classification of a given mortar by test, the strength shall be determined with mortar prepared in a testing laboratory, of representative materials, and in the proportions proposed for use. The test cubes shall be molded, cured and tested for compressive strength as described in the Standard Specifications for Masonry Cement, A.S.T.M. C91-49.

(1) The volume of aggregate in mortar classified by test shall be not less than 2-1.4 times, but not more than 3 times, the volume of cementitious material.

b. Classification by Proportions. When not classified by tests, mortar of the following proportions, with the aggregate measured in a damp and loose condition will be accepted as meeting the strength requirements of mortar types specified above.

PROPORTIONS BY VOLUME

MORTAR TYPE	PORTLAND CEMENT	MASONRY CEMENT (ASTM C 91)	HYDRATED LIME OR LIME PUTTY
S	1	None	Over 1/4 to 1/2
	1/2	1 - Type 2	None
N	1	None	Over 1/2 to 1
	None	1 - Type 2	None

NOTE: The weights per cubic foot of the materials in mortar are considered to be as follows:

Material	Weight per cubic foot
Portland Cement	94 lb.
Masonry Cement	Weight printed on bag
Hydrated Lime	40 lb.
Sand, damp and loose	80 lb. for dry sand

c. Mortar Flow. Mortar of the materials and proportions used in the construction shall have a flow after suction for one minute of not less than 70 percent of that immediately before suction. The flow shall be determined by the method of the Water Retention Test of the Standard Specifications for Masonry Cement, A.S.T.M. C91-49.

d. Mortar Consistency. Where brick facing is used, the mortar shall be of as wet a consistency as can be conveniently handled and it should be retempered frequently if necessary. Mortar which has greatly stiffened or in which the cementing material has started to set shall not be used.

e. Mortar Type Requirements. Type S mortar shall be used in nominal 10 inch cavity walls, and in foundation walls of hollow masonry units.

Type S or Type N mortar shall be used on all other construction.

f. Admixtures. No anti-freeze compounds or admixtures will be permitted in mortar.

4. GENERAL CONSTRUCTION PROVISIONS

a. Storage of Materials. Handle and store materials in such manner as to prevent damage or intrusion of foreign matter. Store concrete units under covers that permit circulation of air and prevent excessive moisture absorption. Store cement, lime, and air setting mortars in water tight sheds with elevated floors.

b. Sample Walls. Before laying any wall construction, the contractor shall build one or more sample walls, 5 feet wide by 4 feet high, as required, for the approval of the Local Authority. The approved wall shall be the standard for exterior and interior exposed masonry wall and partition construction.

c. Workmanship. All masonry work shall be laid plumb, true to line, and with level courses. All bond shall be kept plumb and uniform. Where necessary to build portions of walls to higher level than adjacent portions, rack courses back without toothing. Provide sufficient "line blocks" to maintain level bed joints. Lay out all face coursing before setting and minimize cutting closures or the jumping of bond.

Head joints shall be formed by loading the ends of the brick with mortar and shoving the brick into place. Bed and end joints of solid masonry shall be completely filled without slushing.

Solid masonry units forming dividing partitions between dwelling units shall be laid with both head and bed joints filled solidly with mortar.

Hollow units shall have mortar on shells only (not on crossweb). End joints of shells shall be filled and units shall be shoved into position.

Brick shall be wetted as required so that the rate of absorption of water at the time of laying shall not exceed 7/10 of an ounce per brick (30 square inches) per minute when partially immersed on its flat side to a depth of 1/8 inch in water. Inspection shall be visual with check tests as required by the Local Authority to establish compliance. Concrete units shall not be wetted.

No bats shall be laid as headers or in the exposed face of walls, except for closures when approved by the Local Authority.

Mortar boxes shall be cleaned at the end of each day's work,

d. Joints in exterior walls shall be nominally 3/8 inch thick unless otherwise indicated on drawings. Head joints may vary from 3/8 inch to 9/16 inch to adjust bond and minimize cutting at openings. In exposed wall faces, joints shall be cut flush and as the mortar takes its initial set, shall be tooled with a 1/2 inch diameter round tool 6 inches longer than the length of the masonry unit. Tooling shall compact the mortar tightly against the masonry units on both sides of the joint. Head Joints shall be tooled first.

e. Built in Work. Coordinate work with that of other Divisions so that all connecting work shall be properly installed.

(1) Build in panel boxes, electrical switch and convenience outlets, conduit, piping, anchors, concrete tie beam waterproofing, flashings, expansion joints, and all other necessary incidental work.

(2) Window sills and door sills (if precast) shall be firmly and solidly bedded in mortar.

(3) Provide required bedding and grouting for metal windows. Fill in solid behind metal door frames.

(4) Provide calking spaces of 1/4" wide by 3/4" deep around wall openings or as indicated on the drawings.

(5) Fill hollow masonry units with concrete directly under wall supported beams, lintels, and girders as indicated on the drawings. Hollow masonry units receiving anchor bolts for plates and units back of wall supported sinks, lavatories, and water closets shall be completely filled with class S or N mortar or concrete.

f. Bonding, Joint Reinforcing and Anchorage.

(1) The interior wythe of exterior walls and all interior partitions shall be laid stack bond or running half bond, optional with the contractor.

(2) Interior wythes of exterior walls and all interior partitions shall be laid up with Continuous Joint Reinforcement as specified, the reinforcement to be placed 3 horizontal strips in interior partitions and 2 horizontal strips in exterior walls, 32" o.c. vertically, with the first

strip 24 inches above the floor line. Strips shall overlap in intersections and butting partitions as specified to form anchorage except that at the contractor's option interior partitions may be bonded to exterior walls by corrosion resistant metal anchors 1/8" x 1-½" in cross section and approximately two feet on vertical centers.

(3) Masonry walls shall be securely anchored to wood framed floor and roof constructions as specified in the Division, CARPENTRY AND MILLWORK.

(4) Walls terminating against bottom of beams, or other ceilings and soffits shall be wedged tight and have the joint completely filled with mortar.

g. Chases and recesses shall be built into walls at the time the walls are constructed, so that the structural stability and weather resistance of the wall is maintained.

(1) Masonry directly over chases wider than 16 inches shall be supported on lintels.

(2) There shall be at least 8 inches of masonry between chases and the jambs of openings.

h. Protection. Masonry shall be protected against freezing for at least 48 hours after being laid. Unless adequate precautions against freezing are taken, no masonry shall be laid when the temperature is below 32° F. on a rising temperature or below 40° F. on a falling temperature, No construction shall be built on frozen soil or masonry.

Cover top of masonry walls and partitions at end of each day's work with waterproof paper or canvas where exposed to the elements.

i. Reinforced Concrete Lintels. Furnish and install over all interior door openings not extending the full room height, reinforced concrete lintels, either manufactured by the concrete masonry unit manufacturer, or cast on the job. Lintels shall be height required to conform to door frames and masonry joint above lintel and same thickness as the concrete masonry units of the supporting partition with not less than 4 inch bearing at each end.

(1) Reinforce with two 3/8" round deformed bars, one at top and one at bottom.

(2) Concrete shall be same mix as specified for concrete masonry units, hollow load bearing, and shall have similar surface texture unless otherwise approved.

j. Pointing and Cleaning. Cut out defective mortar joints, refill solidly with mortar and tool as specified.

(1) Brick Work: Upon completion of all exposed brick masonry work, all unpainted brick surfaces shall be thoroughly cleaned as hereinafter directed, special precautions being taken to avoid damage to other adjacent construction. The contractor shall rigidly adhere to these instructions and cleaning shall be continually under competent supervision to see that the instructions are carefully followed, since improper cleaning of the brick can permanently ruin the appearance of the brick work.

(a) Remove large particles of mortar with a putty knife or chisel before washing the wall. A wire brush may also be used.

(b) Not more than one part of commercial grade muriatic to nine parts water. Apply with long handled stiff fibre brush. Pour acid into mixing water - not water into acid.

(c) Soak the area to be cleaned with plenty of water before applying the acid. (This prevents any mortar dissolved by the acid from being drawn into the face of the brick.)

(d) Keep the brick work below the area being cleaned thoroughly soaked with water. (Dissolved mortar from above will then not be drawn into the face of the brick below.)

(e) Clean only a small area at a time, preferably not more than 10 to 20 square feet. (This is a precaution against brick work drying out during cleaning and the subsequent sucking of the dissolved mortar into the pores of the brick.)

(f) Wash the wall thoroughly with plenty of water after scrubbing with acid. (Mortar stains are dissolved during cleaning and must be removed.)

(g) Scrub the brick not the mortar joints. (The brick are to be cleaned - scrubbing mortar joints only dissolves the mortar and adds to the cleaning problem.)

(h) Throw away the acid solution when it becomes dirty. Rinse the brush frequently in clean water.

(i) Don't spare the use of water either before, during or after the cleaning operation.

(2) Interior surfaces of Cement Masonry walls and partitions shall be cleaned of protruding mortar or other obstructions or any foreign material which will adversely effect the finish painting or plaster finish.

k. Miscellaneous Construction

(1) Flue lining and thimbles shall be of sizes shown on the drawings of sound hard-burned, unwarped, fire clay flue tile, free from cracks and spalls. Flue linings shall be placed one section ahead of the masonry and shall be solidly built into place. All joints shall be filled with mortar and struck flush on the inside face of the lining.

(2) Concrete chimney caps shall be of a size and shape as indicated on the drawings, of concrete as specified in Division CONCRETE. Reinforce with two 1/2 inch round bar ties.

5. EXTERIOR WALLS

(1) Brick face and unit masonry backup foundation walls shall have brick laid in common bond with full header courses every sixth course. Facing and backup shall be built up together except corrosion resisting metal ties spaced not farther apart than 16 inches vertically and 24 inches horizontally may be used to bond exposed interior cement masonry facing units to brick back up where floor levels within a building are at different elevations.

(2) Solid brick foundation walls shall be laid in common bond with full header courses every sixth course.

(3) Facing brick in front of concrete surfaces shall be tied back with corrosion resistant metal ties as specified in the division CONCRETE.

(4) Walls of hollow masonry units shall be laid in running or stack bond, optional with the Contractor. Provide 3/8 inch round weep holes for drainage about 3 feet apart, at bottom of walls or as indicated on the drawings.

(5) Cavity Walls shall have masonry facing and backing separated by a continuous air space. Facing shall be bonded to backup with 3/16 inch diameter corrosion resistant steel rod anchors, having not less than 2 inch long lugs at each end, embedded in horizontal joints of each face of wall. Space anchors at least one for each 3 square feet of wall surface and additional anchors spaced not more than 12 inches from openings and not more than 3 feet apart around the

perimeter. Place at least 2 vertical rows of anchors in piers between openings. Keep air space free of mortar or drippings by temporarily placing a wood strip on the wire ties and pulling up the strip with accumulated drippings before placing next row of ties or by other equally acceptable means.

Provide 3/8 inch round weep holes or open head joints for drainage, about 3 feet apart along the bottom of the cavity and just below the front and back concrete tie beams capping the walls to provide ventilation within the cavity. Form a continuous mortar cant at the base of the cavity to divert water to the weep holes.

(a) Exterior facing material shall be selected common brick as specified.

(b) Interior wythe shall be of concrete masonry units, hollow load bearing, except as otherwise shown or specified.

6. INTERIOR WALLS AND PARTITIONS

a. Concrete masonry walls which are not to be plastered shall be made of smooth textured units free from chips and spalls. Concrete masonry walls which are to be plastered shall be made of rough textured units to provide for bond, and have joints struck flush. Walls shall be laid true to line, plumb and with courses level. Joints shall be of uniform size and finished flush.

(1) Interior concrete masonry partitions, except as otherwise specified, shall be of hollow non load bearing type.

(2) Partitions forming dividing walls between Dwelling Units shall be of solid masonry units, and shall extend to the under side of ceiling lath. Where double dividing walls are shown separating dwelling units of different floor levels, only one wythe of the walls is required to be solid.

b. All cutting required for concrete masonry units shall be done with a motor driven carborundum saw to assure clean sharp joints, and as required to fit door frame and similar openings, electrical outlets and similar items of construction. The completed work shall be straight, plumb and level, with two faced units gaged for thickness in setting so as to produce practically flush surfaces on both sides of partition

walls. Openings shall be accurately cut around electrical outlets and pipes so that cover plates and escutcheons will entirely conceal the opening, and fit flush against the masonry surface.

DIVISION 5a

STONE WORK

1. SCOPE

This division includes cut stone window sills and related items required to complete the work indicated on the drawings.

2. MATERIALS

(1) Stone shall be Indiana or Alabama limestone, Ohio sandstone, or any stone which has been used successfully for 20 years under climatic conditions similar to those obtaining at the project site. Stone shall be sound, durable, free from excessive stain, soft spots, seams or defects impairing strength or durability. Stone shall be of color within the usual commercial production of the quarry.

(2) Mortar for setting stone shall be Type N as specified in the division MASONRY. Non-staining cement shall be used with limestone.

(3) Calking compound shall be as specified in the division CALKING.

3. SHOP DRAWINGS

Submit shop drawings showing dimension, profile, jointing, and obtain approval from the Local Authority before fabrication.

4. SAMPLES

Samples of materials proposed for use in the work shall be submitted for approval by the Local Authority. Provide not less than 2 sample pieces at least 8 x 8 inches by 1 inch thick which are typical of the extremes of color and finish it is proposed to supply.

5. GENERAL REQUIREMENTS

a. Cutting. Cut stone shall be cut accurately to shape and dimensions with jointing as indicated on drawings. Exposed surfaces to be true and out of wind; bed and joints dressed for the full thickness of the stone and at right angles to a vertical plane. Joints shall be 1/4 inch wide. Exterior sills shall be cut with a wash as shown on the drawings and drips shall be cut on projecting sills except at windows opening on to porches where they will not be required.

b. Finish shall be smooth-sawed or planed.

c. Protect stone from damage during delivery, storage, or handling. Patching will not be permitted.

6. SETTING

a. Wash stone and drench with clean water just prior to setting. Set stone in full beds of mortar and true to lines and levels. Rake out end joints of slip sills for calking.

(1) Parge back of limestone sills with non-staining mortar.

7. CLEANING AND PROTECTION

a. After setting, clean stone by scrubbing with stiff brushes, using a solution made with non-staining soap powder in clean hot water. After washing thoroughly rinse with clean cold water.

b. Protect stone from traffic, mortar, dirt, and acids used for cleaning brickwork. Leave stone work sound, clean and free from stains.

DIVISION 5b

STRUCTURAL FACING UNITS (TILE OR BRICK)

1. SCOPE

This division includes structural facing units and related items required to complete the work indicated on the drawings and specified.

2. MATERIALS

a. Ceramic Glazed Structural Clay facing units shall conform to A.S.T.M. C 126-54T, Type S, class Standard.

(1) Colors shall be a range of light colors selected from the Facing Tile Institute standard colors.

(a) Kitchen Walls and base. Sun light yellow, coral, light green, in accordance with schedule to be prepared.

(b) All base, other than Kitchens, light grey.

b. Mortar for setting tile shall be Type S or Type N as specified in the division MASONRY.

c. Wall ties shall be galvanized wire loops not less than .12 inches diameter or galvanized corrugated steel 7/8 inches wide and not less than .023 inches thick.

3. SAMPLES

Material proposed for use in the work shall be submitted to the Local Authority for approval. Samples shall consist of not less than 5 stretcher units fully representing the range of shade proposed and permissible defects.

4. GENERAL REQUIREMENTS

a. Storage and Protection. Units shall be delivered, stored, and handled so as to protect them from stain and damage. All units shall be packed in suitable containers to protect edges of both sides and both ends.

b. Units - shall be Series 6T /5-1/3 x 12 inch nominal face dimension of thickness required to carry out the intent of the drawings, but in no case shall units be less than 1-3/4 inch thick, nor shall units or combination of units be less in thickness than the thickness of partition or wall masonry supported by it. Units forming base of partitions having both sides exposed shall be glazed 2 sides and units used at external corners, and at uncased wall terminations or openings shall have the exposed end glazed. Units occurring at plastered surfaces shall have glazed face set flush with the face of the finished plaster surface, and using two 1-3/4 inch or thicker units, flushed solid between backs with mortar to form base flush with plaster on the one side and flush with the painted masonry surface on the other.

c. Units shall be clean. Before setting units shall be sponged or sprayed with clean water to reduce suction.

5. LAYING

Lay units in the pattern and bond as indicated on the drawings. Set units level and true to a line in a full bed of plastic mortar and to a full even bearing. Any permissible variation so far as practicable shall be adjusted and equalized in the process of laying. Joints shall be filled with mortar leaving no voids. Face joints shall be 1/4 inch wide, as nearly uniform as possible. Do all cutting on the job with a motor driven carborundum saw to assure clean sharp joints. Complete work shall be straight, plumb and level.

a. Bond units to previously placed masonry backing with wall ties, or anchor to concrete with anchors as specified under the division CONCRETE.

(1) Metal anchors shall be spaced not more than 16-1/2 inches apart vertically and not more than 24 inches apart horizontally.

b. Joints shall be struck and tooled concave.

c. Clean all exposed surfaces of units upon completion with soap powder in clean water applied with stiff fiber brushes. Rinse with clean cold water. Hard lumps of mortar shall be removed with sharpened wooden paddles. Metal cleaning tools or brushes, or acid solutions shall not be used in cleaning.

DIVISION 6

CALKING

1. SCOPE

This division includes calking and related items required to complete work indicated on the drawings and specified, except setting of metal thresholds in calking compound, which is specified in the division WEATHERSTRIPPING. Completely seal, with calking compound, joints around frames of doors, windows, or other openings in exterior masonry walls, and other joints indicated or specified to be calked.

a. Ends of slip sills shall be calked.

b. Joints between bath tub rims and plaster or ceramic tile shall be calked.

2. MATERIALS

a. Calking compound except at tubs shall conform to Federal Specification TT-C-598, Grade 1, and be delivered to the project in the manufacturers' unopened packages. Color shall be manufacturers' standard as selected by the Local Authority.

b. Joints between bathtub rim and plaster or ceramic tile shall be calked with a white plastic compound made especially for this purpose by MMM, Dicks-Pontius, Miracle Adhesive and American Fluoresit.

c. Yarn shall be vegetable fiber free from any material that will stain masonry or stone.

d. Affidavit. Furnish affidavit from manufacturer, certifying that materials delivered to the job conform to the requirements of these specifications.

3. SAMPLES

Samples as listed below of materials proposed by the contractor for use in the work shall be submitted for approval.

Calking compound	1 gallon
Tub calk	2 ounces

4. APPLICATION

a. Clean Joints and spaces to be calked free from dust, dirt and dampness. Do not calk joints until they are substantially in compliance with details indicated on the drawings and the specifications in the division MASONRY.

b. Pack joints over 3/4 inch deep with yarn to 3/4 inch of the surface.

c. Apply calking compound with a pressure gun having nozzles to fit into the joints. Fill joints solidly and smoothly without thin edges, remove excess compound, and leave adjoining surfaces clean. Joints shall be water-tight.

d. Complete calking before final coat of paint is applied.

DIVISION 7

GLAZING

1. SCOPE

This division includes glass, glazing and related items required to complete the work indicated on the drawings and specified.

a. Glaze windows not otherwise indicated on drawings or specified with DS-B clear glass.

b. Glaze doors so indicated on drawings with DS-B clear glass.

c. Glaze windows in toilets and bathrooms with obscure glass 1/8 inch thick.

2. MATERIALS

a. Glass shall conform to Federal Specifications DD-G-451a and the following schedule:

1.	Window glass	Type LL
2.	Obscure glass	Type IIIc, glazing quality, hammered glass

Manufacturers' labels showing strength and quality shall be attached to glass.

b. Putty for wood sash shall conform to Federal Specifications TT-P-791, Type II, white lead-whiting putty.

c. Glazing Compound for aluminum sash shall conform to Federal Specifications TT-P-781a, Type I, shall be specially prepared for this purpose, shall adhere tightly to the sash, remain plastic, shall not require painting and shall be a light grey color approximating the color of the sash metal. The compound shall have been in satisfactory use for at least two years. The contractor shall furnish the names of 3 buildings where it has been used as near as practicable to the project so that it may be inspected by the Local Authority.

d. Affidavits from the manufacturers certifying that putty and glazing compounds comply with requirements of this specification shall be submitted to the Local Authority.

3. SAMPLES

Samples as listed below shall be submitted to the Local Authority for approval.

Putty	2 quarts
Glazing compound	2 quarts
Obscure glass	2 sq. feet

4. GLAZING

a. General. Surfaces shall be dry and free from dust, rust or ice before glazing. Dirty surfaces shall be cleaned with a cloth saturated with turpentine or mineral spirits before glazing. Putty shall not be applied in temperatures below 40 degrees F or during damp or rainy weather. Do not glaze wood doors until they have received a priming coat of paint as specified in the division PAINTING. Do not handle after glazing until the putty or glazing compound has set. Obscure glass shall be set with smooth side out.

b. Bed glass completely in putty. Apply face putty with sufficient pressure on the knife to insure complete adhesion to glass and rabbet. Cut off excess immediately after glass is bedded. Face putty shall be full, smooth and with accurately formed bevels having clean cut miters.

(1) Putty shall be used as it comes from container without adulteration and only after thorough remixing. If thinning is required, use only white gasoline and not more than one tablespoon per gallon of putty.

c. Doors shall have glass completely bedded in putty and set with glazing beads.

d. Metal windows shall have glass completely bedded in compound, secured in place with wire glazing clips and glazed as specified or glass shall be completely bedded in compound and be secured in place with glazing beads.

e. Ventilate building after glazing by opening windows slightly top and bottom sufficient to prevent condensation of water on the glass and bed putty. Maintain such ventilation until glazing compound or putty is set and painting is complete and dry.

5. CLEANING

Clean glass on both sides after painting is complete and dry. Do not disturb putty with scrapers. Do not use acid solutions or water containing caustic soaps. Broken, cracked and glass not complying with these specifications shall be replaced. At completion of work glass, putty and other glazing material shall be clean, whole and in perfect condition.

DIVISION 8

ROOFING, SHINGLES

1. SCOPE

This division includes roofing and related items required to complete the work indicated on the drawings and specified.

2. MATERIALS

a. Asphalt shingles shall conform to Federal Specification SS-S-298 or SS-S-300. Type and weight in place shall be as specified herein. Color shall be blue black or slate blend conforming to manufacturers' standard as selected by the Local Authority but not more than one will be selected. Asphalt shingles shall bear Underwriter's Laboratories Class C labels.

(1) Shingles shall be rectangular strips weighing not less than 250 pounds per square. 3 tab 12 x 36 inch thick butt or 4 tab 10 x 36 inch standard type, or

(2) Shingles shall be self spacing individual interlocking shingles of from 18 to 24 inches width and length, having locking tabs or projections, providing complete double coverage and weighing not less than 250 pounds per square.

b. Asphalt saturated felt shall conform to Federal Specification HH-F-191a Coal tar saturated felt shall conform to Federal Specifications HH-F-201a.

c. Roll roofing shall conform to Federal Specification SS-R-521.

d. Plastic cement shall conform to Federal Specification SS-C-153, Type k. It shall be mixed to proper consistency at the factory and delivered in sealed containers.

e. Nails

(1) Nails for fastening asphalt shingles shall be large headed roofers' zinc-coated of adequate size.

(2) Nails for fastening felt shall be large head, galvanized roofing nails.

3. GENERAL REQUIREMENTS

a. Roofing shall not be laid until all sheet metal and gutters or other work which extends under roofing material has been satisfactorily installed as specified in the division SHEET METAL.

b. Flashing. Coordinate roofing work with flashing of intersections of roofs with vertical surfaces, all openings in roof surfaces and other sheet metal work.

c. Roof and flashings shall be weathertight, free from leaks and other defects.

4. APPLICATION

a. General. Cover roof surfaces with 15 pound bituminous saturated roofing felt before laying asphalt shingles. Double felt not less than 36 inches wide at valleys, hips and ridges. Extend up vertical surfaces 6 inches. Lap horizontal joints 3 inches, vertical joints 6 inches. Nail to sheathing 12 inches on center in both directions through metal discs.

b. Asphalt shingles shall be applied as follows:

(1) Form valleys by laying a 36 inch wide strip of ready roll roofing the same color as the shingles over an 18 inch wide strip of the same roofing. Lay strips centered over the valley, in close contact at the center, with 6 inch end laps. Bed laps in plaster cement and nail strips one inch from edges with roofing nails 12 inches on center. Cover nail heads with plaster cement.

(2) A metal edge consisting of a 5 inch wide strip of sheet metal of the same thickness and material as specified for flashing in the division SHEET METAL, with edges bent down to form a drip shall be applied to eaves, rakes, and including eave over ridge vent. Lap sections 2 inches at eaves, and 1 inch at rakes. Nail at rear edge 8 inches on center. Similarly provide continuous flashing strip to receive top ends of shingles at base of ridge vent as detailed.

(3) Apply starting courses and field courses with true horizontal and vertical lines and nail securely, both in exact accordance with the printed instructions of the manufacturer. Strip shingles shall be laid with a 2 inch headlap.

(4) Nail shingles with large head, zinc coated roofing nails 1-1/2 inches long. Use 6 nails to each 12 x 36 three tab strip and 8 nails to each 10 x 36 four tab strip.

(5) Ridges, including ridge over ridge vents, shall be applied by bending individual rectangular shingles so as to have equal exposures, not less than 5 inches on each side. Lay with not over 5 inch exposure or less than 2 inch headlap, nailing 5 1/2 inches from exposed end and 1 inch from each edge. Cover nails in last shingle with plastic cement. Warm shingles in cold weather before bending.

5. GUARANTEE

Roofing shall be weather and water tight. The roof, exclusive of sheet metal work, shall be guaranteed by the contractor against leaks due to defects in material or workmanship for a period of 5 years.

DIVISION 8a

SHEET METAL, COPPER

1. SCOPE

This division includes sheet metal work and related items required to complete the work indicated on the drawings and specified except that heater and plumbing system vents will be furnished and installed including flashing, under Division 25, HEATING AND PLUMBING.

2. MATERIALS

Gages of wire are given in Brown and Sharpe wire gage.

a. Sheet metal shall be copper conforming to Federal Specification QQ-C-576a, 16 ounce light cold rolled temper except as otherwise specified.

b. Solder shall be 50 percent lead and 50 percent tin (in bars bearing manufacturers' name and brand) and conform to Federal Specification QQ-S-571b, Class A.

c. Flux shall be muriatic acid killed with zinc or a non-acid flux in paste form.

d. Bituminous plastic cement shall conform to Federal Specification SS-C-153, Type1. It shall be delivered in the manufacturers' original sealed containers.

e. Asphalt coating for paint shall conform to Federal Specification SS-R-451.

f. Nails, screws, and bolts for fastening copper shall be copper, brass or bronze. Nails shall be not less than 10 gage (.1019 inches) needle pointed nails long enough to penetrate wood 1 inch except that nails for use with fiberboard shall be a locking type nail approved by the Local Authority.

g. Expansion shields shall be lead, bronze or equal non-ferrous alloy.

h. Cleats shall be made of 16 ounce cold rolled copper, unless otherwise specified.

3. SAMPLES

Samples of materials proposed for use in the work as listed below shall be submitted for approval by the Local Authority.

Gutters(each type)	2 lineal feet
Leaders	2 lineal feet
Gutter Hangers	3 pieces
Leader straps	3 pieces
Sill and Lintel Flashing Material	2 sq. ft. each

4. GENERAL REQUIREMENTS

a. Surfaces to be covered with sheet metal shall be smooth and free from holes. Surfaces shall be cleaned of dirt, rubbish and other foreign materials before sheet metal work is started. Projecting nails shall be driven flush with the roof boarding.

b. Joints and seams shall be avoided as much as possible. Overlap seams in direction of flow of water. Make ample provision for expansion and contraction.

c. Soldered seams and joints shall have metal tinned for full area of contact. Soak single locked seams with solder. Do soldering slowly with well heated coppers, thoroughly heating seams and completely filling them with solder.

d. Clean sheet metal as each section is completed. Neutralize excess flux by washing metal with a solution of washing soda. After cleaning, wash with clear water. Avoid staining or discoloring brick or other adjacent work.

e. Sheet metal work shall be water and weather tight with lines, arrises and angles sharp and true and plain surfaces free from waves and buckles.

f. Soldering shall be done with heavy soldering coppers of blunt design, properly tinned before using. They shall weigh not less than 10 pounds per pair except that on automatically heated units the copper itself shall weigh not less than 3 pounds.

5. INSTALLATION

a. Base flashings shall extend up vertical surfaces not less than 8 inches and on flat surfaces not less than 4 inches. Base flashing shall be in sections not over 10 feet long. Straight runs of base flashing shall be made up with locked and soldered joints in units not over 20 feet long.

Units shall be connected together with 3 inch wide loose lock slip joints filled with roofing plastic before units are hooked together. Similar slip joints shall be placed not more than 10 feet from any external or internal corner on long straight runs. Corners shall be lapped and soldered. All seams shall be soldered in a flat position.

b. Shingle or stepped flashing shall be formed of separate pieces woven in with each course of shingles. Each piece shall extend out onto roof not less than 4 inches and up on vertical wall 4 inches. Lap vertically not less than 3 inches. Do not solder joints.

c. Counter flashing shall be formed in lengths not to exceed 10 feet. The counter flashing shall extend in reglet or joint of the wall 1 inch with edge turned up 1/4 inch and down over base flashing not less than 4 inches. Joints shall lap 4 inches. Metal shall be formed to provide spring action against the base flashing. Secure with copper spiral fasteners and fill joint or reglet with plastic cement.

d. Lintel flashings formed of 10 ounce cold rolled copper shall overlap the vertical part of the lintel 2 inches and extend 8 inches beyond the lines of the jambs and shall be furnished at all windows not protected by overhanging eaves or soffits, and as shown on the drawings.

e. Window sill flashing of 3 ounce electrolytic copper cemented to kraft paper shall be applied

formed turned up at back 2 inches and 4 inches beyond ends of all window sills. Front edge shall be held 1/2 inch back from face of wall.

f. Chimney Flashing. Step flashing shall be woven with each course of shingles. At corners the base flashing shall be connected by a lapped or locked and soldered seam. Provide counter flashing for chimney.

g. Gutters shall be hung half-round as indicated on drawings of copper in lengths of not over 10 feet. The ends shall be joined by 1 inch lapped, riveted and soldered joints. Lap joints in direction of flow. Rivets shall be 3/16 inch copper spaced 2 inches apart. Provide rolled or formed beads on the outside of half-round gutters. Reinforce beads as indicated on drawings.

(1) Provision for expansion located at high points of run, consisting of a 1 inch separation of ends of gutters, shall be provided at intervals of not to exceed 50 feet unless otherwise indicated on the drawings. Leave gaps of 1 inch between ends of gutters and intersecting walls. Provide caps over expansion gaps. End pieces, miters and outlets shall be provided where required.

(2) Hangers for support of gutters shall be brass adjustable shank and circle type, spaced not more than 3 feet apart and securely fastened to roof deck under roofing by 3 copper nails. Hangers shall be let into sheathing or cant or otherwise installed to allow roofing to lay flat over hangers.

(3) Slope gutters to leaders not less than 1 inch in 20 feet.

(4) Outlet tubes shall be formed with locked and soldered longitudinal seam. The upper end of tube shall be flanged 1/2 inch, and soldered to gutter. Tube shall extend into leader not less than 3 inches.

(5) Strainers of No. 14 gage copper wire shall be provided at all outlet tubes. They shall be wire basket type and fit snugly in the outlet tube.

h. Leaders or downspouts shall be fabricated of crimped or corrugated sheet copper in 8 or 10 foot lengths. Longitudinal joints shall be locked. End joints shall telescope not less than 1-1/2 inches and be held in place with solder. Include all necessary elbow, offsets, etc. Leaders shall be rectangular or round of nominal dimensions indicated on the drawings. Support leaders with 3 inch copper straps having hemmed edges, straps to be spaced not to exceed 10 feet, and over joints where possible, and not less than two straps to be provided per downspout. Straps shall be designed to hold leaders off the wall or leaders shall be offset at the foot sufficient for joining to the Terra Cotta rain water boot turned up to receive the leader. Fasten straps to masonry with bronze screws driven into corrosion resistant sleeves.

(1) Leaders shall be fitted into Terra Cotta drain pipes provided under DIVISION 22, UTILITIES (SEWERS), with neatly calked and cemented joints. Provide elbows at bottoms when not connected to drain pipes.

(2) Leaders shall be of round or rectangular design and nominal dimensions indicated on the drawings, or of other stock design approved by the Local Authority. Outlet tubes from gutters shall extend into heads not less than 3 inches.

i. Miscellaneous sheet metal items not covered elsewhere in this section shall be as indicated on the drawings and as required to provide a watertight installation. Formed sheet metal shall accurately represent the design shown. Joints shall be lapped or locked and soldered as applicable. Reinforce as required.

DIVISION 8b

WATERPROOFING

1. SCOPE

This division includes waterproofing and related items required to complete the work indicated on the drawings and specified.

(1) Waterproof walls occurring at changes in elevation of floor levels as shown on the drawings with 3-ply membrane. Waterproofing shall extend from top of footing to underside of the higher floor slab and extend into masonry under the slab bearing and turn up as shown on the drawings. Turn the waterproofing back one foot on front and rear walls at the ends of the division walls.

2. MATERIALS

a. Coal-tar-pitch shall conform to Federal Specification R-P-381, Type II.

b. Creosote oil shall be a distillate of coal gas tar or coke oven tar.

c. Felt shall conform to Federal Specification HH-F-201, Type I.

d. Furnish affidavits from the manufacturers, certifying that the materials delivered to the project conform to the requirements of these specifications.

3. PREPARATION OF SURFACES

a. Remove fins, loose materials and foreign matter. Fill holes with mortar and clean down as necessary to provide proper surfaces for waterproofing. Where necessary, apply a coat of portland cement mortar to the faces of masonry walls to obtain a smooth surface as a base.

b. Surfaces must be dry when membrane waterproofing is applied.

4. APPLICATION

a. Carefully protect adjoining surfaces from waterproofing materials. Immediately remove any misplaced materials. Clean or replace any items damaged by waterproofing.

b. Fill with cement mortar all openings in walls to be waterproofed.

c. Apply membrane waterproofing in the following manner:

(1) Coat surfaces with a coat of creosote oil at the rate of 1 gal. per 100 sq. ft.

(2) Coat surfaces with hot coal-tar-pitch, using not less than 30 pounds per square. Apply 3 layers of 32 inch wide coal-tar-pitch saturated felt, lapping each sheet 22 inches over the preceding sheet. (If 36 inch wide felt is used, lap sheets 24-1/2 inches.) Lap ends not less than 6 inches. Mop each of the sheets full width of lap, with hot coal-tar-pitch, using not less than 30 pounds per square for each mopping. Over the entire surface apply a uniform mopped on coat of hot coal tar, using not less than 30 pounds per square.

(3) Connect membrane waterproofing of tops of footings and walls and returns on end walls, and provide a continuous unbroken watertight seal.

(4) Protect membrane waterproofing coatings on walls with sisal reinforced building paper before back-filling.

DIVISION 9

WINDOWS AND SCREENS, ALUMINUM

1. SCOPE

This Division includes casement aluminum windows, screens, and related items required to complete the work indicated on the drawings and specified. Calking and glazing are specified under other divisions of this specification.

2. GENERAL

Stock commercial windows and screens will be accepted, including hardware and manufacturers standard sections, provided they conform to requirements of the Aluminum Window Manufacturer's Association Specification No. C-Al for Casement Windows.

(1) The sizes of casement windows shall be as indicated on the drawings.

(2) Furnish affidavit from the manufacturer of the windows that the windows delivered to the project meet all requirements of Specification No. C-Al of the Aluminum Window Manufacturer's Association.

3. SHOP DRAWINGS

Shop drawings showing design and details of aluminum windows, aluminum screens and items covered by this division shall be submitted to the Local Authority for approval.

4. SAMPLES

A sample consisting of one of the largest windows scheduled for the project shall be forwarded for test to a testing laboratory selected by the Local Authority. Samples passing the tests shall become the standard to which windows furnished for the project shall conform.

5. SCREENS

All openable areas in windows shall be screened unless otherwise indicated. Screens shall be of manufacturers' standard design, shall effectively bar passage of insects to the building through the windows, shall fit closely and neatly around the openable area, be easily removable from the inside and be interchangeable with screens of the same size and type. All necessary hardware and attachments, clips, bolts and screws for a secure and insect proof screen shall be provided.

a. Frame members of screens shall be of extruded or formed sheet aluminum, of .032 inch thickness, or of non-magnetic stainless steel, with corners welded, spot welded, brazed, or mechanically connected in a secure and workmanlike manner. The spline shall be of aluminum or other suitable material compatible with aluminum. Screens shall be easily rewirable with hand tools.

(1) Screens for ventilators with friction hinges shall be inside screens. Screens for ventilators with friction hinges shall have sliding wickets with ample arm room for operating the ventilators. Wickets shall clear locking handles when ventilators are closed.

6. ERECTION

a. General. Windows shall be stored at the site in an upright position on wood sills in a manner which will prevent injury to windows or to protective coatings.

b. Install casement windows and trim accurately to line, plumb and true without distortion. Install hardware and adjust windows prior to glazing to operate freely and close evenly. When ventilators are closed and locked, the metal to metal contact shall be so close that a 1/32 inch feeler gage cannot be inserted without forcing.

c. Casement windows shall be installed after erection of continuous fins, completion of the walls, and pouring of the concrete wall tie beam.

d. Clean exposed parts of the window after painting is complete.

DIVISION 10

METAL DOOR BUCKS AND DOORS

1. SCOPE

This Division includes combination metal bucks and frames, metal doors, and related items required to complete the work indicated on the drawings and specified. The words "buck" or "frame", wherever used in these specifications, mean combination metal bucks and frames.

a. Hardware and field painting are specified in other divisions of these specifications, except that for metal folding doors which is furnished with the doors.

b. Locations and details shall be as indicated on drawings and schedules.

2. COMBINATION METAL BUCKS AND FRAMES AND METAL FOLDING DOORS

a. Materials. Steel shall be first quality cold rolled or hot rolled pickled. Except as otherwise specified, steel shall be of the following minimum thicknesses, U. S. Standard Gage:

Combination bucks and frames	18 gage
Flush door panels	24 gage
Lock, strike, and flush bolt reinforcement	16 gage
Hinge and check reinforcement	11 gage

b. Samples of materials for use in the work as listed below shall be submitted to the Local Authority for approval:

6-inch corner section of combination buck and frame.
Cut out corner section of door panel.

c. Shop drawings showing thickness of metal, details of construction, profile of moldings, connections to other work, fastenings and anchors shall be submitted to the Local Authority for approval.

d. General Requirements. All shapes shall be formed, rolled and formed, or cold drawn with contours and arrises as true and sharp as can be produced in the thickness of metal required.

(1) Weld construction joints of frames full depth and width or weld equivalent splice plates on unexposed faces of frames, or weld miters of frames. Exposed surfaces of welded joints shall be smooth. Butted or mitred joints on the face of trim shall fit within 1/64 inch. Other joints shall fit within 1/32 inch. Welding shall be used where practicable in preference to the use of rivets, screws, or bolts.

(a) Frames shipped knocked down will not be accepted.

(2) The finished work shall be strong and rigid, neat in appearance, and free from objectionable defects. Plain surfaces shall be smooth and free from warp or buckle. Molded members shall be clean, cut, straight, and true. Miters shall be well formed and in true alignment. Fastenings shall be concealed where practicable.

(3) Cut outs shall be accurately located and made to fit the hardware. Cut outs shall have dust covers of steel sheet welded in place to prevent mortar and plaster from contact with the reinforcing plates and lock strikes.

(4) The manufacturer of doors or frames shall fit, drill, and tap for locks, strikes, hinges and concealed hardware. Drilling and tapping for other hardware shall be done at the job where its exact location can be established during installation.

(a) Reinforcing plates shall be provided in frames for strikes, door closers, and flush bolts and for hinges except for hinges which are welded to the frames. Reinforcement shall be offset so that surfaces of hardware will finish flush with surfaces of doors and frames. Hinges shall be fastened to reinforcement with flat head machine screws or to the back surface of metal bucks by spot or projection welding. Reinforcing shall be concealed, extend past hardware enough to develop the strength of the frame, be welded in place and be tapped for hardware fastenings as specified above.

(b) Any hinge welded to frame shall ring soundly when tapped by a carpenter's hammer. Hinges indicated to have imperfect welds by this test shall be tested by the contractor, in the presence of the representative of the Local Authority, as follows: The frame shall be fastened in an upright position and the hinge subjected to a load of 150 pounds suspended from the hinge. Any indication of failure of the welds shall be cause for rejection of the frame.

(c) Lock strikes for wood doors shall be supplied by the manufacturer of the hardware or shall be universal strikes provided they comply with the specifications for hardware in the Division, HARDWARE BUILDERS.

(d) Where locations of hardware are not indicated on the drawings, the following requirements shall apply: Door knobs shall center from 36 to 38 inches above the floor. Door pulls and push plates shall center not more than 45 inches above the floor.

e. Frames unless otherwise indicated or specified shall be combination buck and frames, channel section rabbeted for doors. Edge of flanges shall be turned to form plaster stops where plaster occurs and to form retainers for adjustable anchors.

(1) Adjustable anchors for frames in masonry shall be of steel T-shaped and of the same thickness as metal of the frames. The head shall give equivalent strength and shall positively engage the retainers on both flanges of each jamb member when in place. The stem shall be corrugated or perforated for mortar bond and extend at least 4" into the masonry. The stem shall be not less than 1-1/2" wide. Anchors shall be placed near the top and bottom of each jamb and at one intermediate point and shall lie flat in the masonry joints.

(2) Base angle for fastening to floor shall be welded to each jamb section or fastened thereto with bolts or rivets with flattened heads.

(3) Each door frame shall be provided with two erection struts, manufacturer's standard type arranged to fasten to ceiling construction by means of lag bolts fastened into wood blocking or other approved equivalent, or at contractor's option erection struts may be omitted, subject to approval by the Local Authority of an alternate system for bracing and holding frames plumb and in alignment while building into the walls.

(4) Frames shall be shipped separately with removable spreaders or nested in pairs and bound tightly together.

(5) Shop Coat. All surfaces of frames shall be cleaned and coated with an oven dried shop coat of rust inhibitive paint which will produce a hard tough film of good appearance, flexibility, and rust resistance.

f. Metal Folding Doors shall be of folding type and size indicated on the plans and schedule. The door shall consist of four panels hinged in pairs folding back from the center of the opening. The unit shall be sound deadened, operate smoothly on nylon pivots from a heavy gauge formed metal track to be placed across the head of the opening. Units shall be delivered individually packed in heavy cartons containing the panels, track, and all necessary hardware including finger pulls.

(1) Track shall be heavy gauge formed metal furnished with anti-friction bearing inserts at pivot points, and pierced for mounting with wood screws to ground installed by the Carpentry Contractor.

(2) Panels shall be of 24 U. S. gauge cold-rolled fine quality steel, with edges formed to give maximum rigidity, and metal stiffeners, and each panel furnished with sound deadening material for quiet operation.

(3) Finish with factory applied baked-on enamel simulated natural birch grain.

3. ROLLING DOORS

Doors shall be of the rolling steel spring counterbalanced lift, coiling type, operated from both sides; the curtain to travel in steel guides suitably mounted with 1 inch lap at sides of opening.

(1) Curtain shall consist of interlocking slats rolled from not lighter than 22 gage (.030 inches) steel, zinc-coated (hot dip) at the rate of not less than 1.2 ounces of zinc per square foot of flat metal and then shall be prepared for painting by a hot-dip phospate or a cold phosphate chromate treatment standard with the manufacturer.

(2) Provide malleable iron endlocks with wind baffle ribs on both ends of each slat and finish the bottom of curtain with suitable steel stiffening member fitted with zinc-coated lift handles and (at one end) a locking device consisting of a slide bolt and padlock.

(3) Curtain counterbalance shall consist of steel springs wound in helical form from oil tempered and heat treated wire and heat-treated after forming; springs shall be fully enclosed in barrel with means for adjustment. Main bearings of spring barrel assembly shall be steel ball or roller bearings, grease packed and sealed to require no further lubrication.

(4) Supporting bracket shall be of cast iron or welded steel plate assembly. Hood enclosing curtain coil shall be zinc-coated steel not lighter than 24 gage, with edges flanged, beaded or reinforced.

(5) All metal parts including zinc-coated surfaces, but not including bearings and enclosed parts protected by grease or oil, shall be cleaned and dried and given a shop coat of rust inhibitive paint, standard with the manufacturer.

(6) Channel frame at jambs is furnished under Division No. 11.

4. STORAGE AND ERECTION

Doors and frames shall be stored at the site in an upright position on wood sills or on floors in a manner which will prevent rust and injury.

a. Install frames in position plumb, rigid, in true alignment and fasten to retain position and clearances during construction of partitions. Erection struts for frames in masonry partitions shall be removed after masonry is placed to the level of the top of the frame. Fill against metal door frames solidly with masonry mortar or gypsum plaster.

b. Install doors in position as scheduled on the drawings and in accordance with manufacturers' instructions.

DIVISION 10a

METAL TOILET PARTITIONS

1. SCOPE

This division includes metal toilet partitions and doors, and related items required to complete the work indicated on the drawings and specified.

2. GENERAL

Toilet partitions shall have flush panels and doors, be floor mounted, with posts and head rail and shall include fittings, hardware, fastenings and finish for a complete installation.

3. SIZE

Unless otherwise indicated on the drawings the dimensions of the partitions shall be not less than as follows:

Enclosure	width	As required by drawings
	depth	As required by drawings
	height	5 feet 10 inches
Door	width	2 feet 2 inches
	height	4 feet 10 inches
Floor clearance		1 foot 0 inches
Floor to top of rail		6 feet 10 inches

4. MATERIALS

Materials shall comply with the following requirements: sheets for posts, rails and face plates of doors and partitions shall be cold-rolled zinc-coated, bonderized and stretcher leveled steel. Strips for edge binding shall be cold-rolled, tight coated, zinc-coated and bonderized suitable for die drawing without fracture of coating.

a. Cores of partitions and doors shall be 6-ply corrugated fiberboard cemented and assembled and compressed to approximately one inch in thickness.

b. Fittings shall be malleable iron or steel.

c. Gages of metal shall be U. S. standard minimum for sheet steel without zinc coating and prior to fabrication, as follows:

Doors face plates	22 gage
Partition face plates	20 "
Posts and rails	18 "
Edge binding strips	20 "
Concealed hooks and reinforcing for tapping	14 "
Concealed reinforcing for anchoring device	12 "

5. SAMPLES

Samples of hardware and fastenings and a sample showing base metal and the prime and finish coats of enamel shall be submitted to the Local Authority for approval. Samples of manufacturers standard colors shall be submitted for color selection by the Local Authority.

6. SHOP DRAWINGS

Shop drawings showing details of construction, gages of metal, hardware, fittings and fastenings shall be submitted to the Local Authority for approval.

7. WORKMANSHIP

Doors and partitions shall be made up of two face plates with U-formed edges, glued under pressure to the core and assembled by interlocking the edges with die drawn, slip-lock binding strips, which shall hold the plates with a tension grip and be mitered and welded at corners with welds ground smooth; the outer face of the strips to be uniformly rounded except that the contact edge between posts and partitions shall be flat. Doors shall be further strengthened by internal bracing or by welding the locking strips to the U formed edges half way in elevation of each side. Surfaces shall be smooth and free from wave, warp or buckle.

a. The doors and partitions shall finish uniformly one inch thick. Doors and partitions shall have concealed tapped reinforcement for the attachment of hardware, fittings, and accessories, where machine screws are specified for fastenings.

b. Partitions shall be anchored to posts by not less than three hooks in shear built into partitions and inserted into posts through vertical openings. When forced downward the hooks shall draw the posts and partitions together to a tight joint.

c. Partitions shall be anchored to walls by two supports, each through bolted to the partitions with a sex bolt and fastened to wall by bolts of type appropriate to the wall construction.

d. Posts and head rails shall be square tubing not less than 1-3/4 x 1-3/4 inch with head rail fittings finished to match the partitions. Posts shall be supported and fastened by means of an anchoring device permitting adjustment to uneven floors. Posts shall have a shoe base of heavy cast chromium-plated bronze secured in place by screws in expansion joints.

8. FINISH

All exposed surfaces of steel shall be factory finished by spraying one coat of a properly formulated synthetic primer followed by a color coat of low gloss synthetic enamel in two applications and oven dried. Color shall be as selected by the Local Authority from colors standard with the manufacturer. Exposed surfaces of bases, hardware, and their fastenings shall be finished in polished chromium plate.

9. HARDWARE

Hardware for toilet partitions shall conform to Federal Specification FF-H-136. Doors shall be hung on gravity type hinges adjustable to permit doors to be self-closing, self-opening or ajar. Set hinges to open door inward and to hold door open at 30 degrees.

a. Each enclosure door shall be fitted with a throw latch and a combination coat and hat hook with a rubber tipped bumper; all to be secured with machine screws. The latch shall include a combination keeper and bumper.

b. Hinges, pivots, bumpers and keepers shall have clamp flanges which transmit the strain of the slam of the door to the posts.

c. Furnish and install in each enclosure one roll-type paper holder conforming to Federal Specification WW-P-541a, Type 435, secured in place with machine screws.

10. ERECTION

The enclosures and partitions shall be erected in a rigid and substantial manner, straight and plumb with all horizontal lines level. All evidence of drilling, cutting and fitting on walls and floor finish shall be concealed by the finish work. The clearance at vertical edges of doors shall be uniform from top to bottom and shall not exceed 3/16 inch. Doors shall be out of wind, and hardware shall be carefully adjusted and left in perfect working order. Finish surfaces shall be cleaned and left free from imperfections.

DIVISION 11

MISCELLANEOUS AND ORNAMENTAL METAL

1. SCOPE

This division includes structural steel, miscellaneous and ornamental metal work and related items including required anchors, bolts, hardware and other accessories required to complete the work indicated on the drawings and specified, except work not a part of the building which is specified in the Divisions UTILITIES (SEWERS AND WATER), LAWNS AND PLANTING, and SITE IMPROVEMENT.

2. MATERIALS

Materials shall comply with standard specifications as follows:

a. Steel - QQ-S-741, type I or type II as best suited, grade B, Class 1.

b. Structural Steel and bolts shall conform to A.S.T.M. Standard Specification for Structural Steel for Bridges and Buildings, A7-46.

c. Cast iron shall be soft, tough, gray iron, true to pattern, clean and free from injurious flaws and defects. Malleable castings shall be heat treated to produce tough castings.

d. Wire shall be cold drawn steel unless otherwise specified.

e. Aluminum extruded; A.S.T.M. Specification 221-49T, alloy GS 10A, commercially known as 63S.

f. Bronze shall be the best commercial grade of copper-zinc alloy architectural bronze.

g. Paint, except as otherwise specified, shall be red-lead linseed-oil type conforming to current Federal Specification TT-P-86a, Type I.

3. SHOP DRAWINGS

Shop drawings giving sizes, details of construction, methods of assembly and location of hardware shall be submitted to the Local Authority for approval.

4. GENERAL

Stock commercial material, products, patterns and fabrication methods meeting requirements of this specification and conforming substantially to details and design indicated on the drawings will be accepted. See the drawings for location, size and details not covered in this specification.

a. Built-in-items shall be supplied in ample time for incorporation in the work.

b. Gages for sheet metal are U. S. standard gages and gages for wire are U. S. Steel wire gage.

c. Prime coat ferrous metal, except cast iron, and except materials to be embedded in concrete or masonry with a rust inhibitive primer standard with the manufacturer, after cleaning free from oil, rust, and dirt.

d. Anchors to masonry not otherwise indicated shall be strap steel 1-1/2 x 3/16 inches bonding 8 inches into masonry and with ends turned up 2 inches and welded or riveted to frames. Anchors shall be spaced not to exceed 2 feet 6 inches on centers and not less than 2 anchors shall be furnished for each side of a frame.

5. DESIGN AND FABRICATION

a. Proportion items to meet the applicable building code and to support any live loads which may normally be imposed unless specific live loads are indicated on the drawings.

b. Structural design of items covered by this specification shall conform to the Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings of the American Institute of Steel Construction.

c. Fabricate work to shape and size with sharp lines and angles and smooth surfaces. Connections shall be securely welded, bolted or riveted. Welds shall be dressed smooth on exposed surfaces. Rabbets, lugs and brackets shall be provided so that the work can be assembled in a neat substantial manner. Thickness of metal and detail of assembly and support shall give ample strength and stiffness. Built up parts shall be out of wind. Exposed ends and edges of metal shall be smooth. Joints exposed to the weather shall be formed to exclude water or to drain.

d. Column bases shall be set level and to correct elevation on full beds of portland cement mortar.

e. Welding shall be in accordance with current "Code for Arc and Gas Welding in Building Construction" of American Welding Society.

f. Holes for the attachment of work by other trades shall be provided as required, and shall be punched or drilled; cutting torch shall not be used.

6. ITEMS OF METAL WORK

a. Pipe sleeves through masonry or concrete walls and footings for weepholes in retaining walls, for wall hydrants, service lines entering the building, and similar work shall be standard weight, wrought iron, mild steel or cast iron sleeves with not less than 1/4 inch space all around between the sleeve and pipe, and shall be furnished under the respective Divisions of the Specifications for which work the sleeves are required.

b. Channel Door Frame at Overhead Roll-up door shall be of structural steel channel of size shown with mitred and welded corners. Make necessary provision for attachment of door runner guide members and hardware, and provide anchors for bonding jambs in to both the inner and outer wythes of masonry at 2'-0" centers vertically.

c. Clean-out door for masonry flue of the non-dwelling building shall be cast iron with flange type frame and with anchors to be built into the masonry. The door shall have 2 hinges, latch, and knob, and height and width shall be approximately the width of the flue.

d. Wire mesh partition shall consist of a framework of steel posts and rails filled and stiffened by fixed wire panels. For height and spacing of posts, location of door, etc., see drawings.

(1) All posts shall have flanged fittings at floors and ceilings. Posts at wall and partition shall be fastened to the masonry by 1/4" diameter oval head machine screws 2" long using expansion shields of not greater than 30" centers with post held away from the wall by lead washers.

(2) Fixed panels and supporting frames of hinged doors shall be fastened to posts and rails with oval head screws or through bolt; at least two on each side near the corners and at points between not more than 18 inches on centers. Where practicable, through fastenings shall be used instead of screws.

(3) Wire fabric shall be round steel wire not less than 11 gage and woven to not over 2 inch double crimped mesh.

(4) Frames of wire panels and doors shall be hot rolled steel channels not less than 1 x 1/2 x 1/8 inches. Channel frames shall be braced with horizontal bar at center. Back bands, cover strips, strikes, astragals riveted or welded.

(a) Steel frames of wire grills and panels shall be tenoned and riveted or mitered and welded at the corners, except that the corner joints of hinged doors shall be mitered, webs lapped and joints full welded. One channel of intermediate cross rail shall be welded on the back to the abutting frame member and through riveted to the opposite channel at ends and points between not more than 9 inches apart. The wire filling shall be let into the frame and the end of wire shall be turned, headed or welded.

(b) Channel frames for doors shall have cover plates secured to the frame every 9 inches by countersunk rivets or welding. The cover plates shall be continuous around all corners and in as long lengths as practicable. Cover plates shall be cut to receive the butts and one leaf of each butt shall be full welded to the hinged unit.

(5) Vertical members or posts of framework for partitions may be steel tubing of 1-1/4 inch nominal inside diameter or 2 inch "tee" (2 x 2 x 3/16) or 2-1/2 inch angles (2-1/2 x 2-1/2 x 1/4). Flanged fitting of pipe posts shall be of malleable iron with set screw to post or for shapes, angle clips shall be welded or riveted to top and bottom for anchorage; wood screws, expansion screws, toggle bolts or tap screws as most suitable shall be used for anchorage of uprights.

(6) Wire mesh work shall be erected in a rigid substantial manner straight and plumb with horizontal lines level. Hardware shall be adjusted and doors left in perfect working order.

(7) Door Hardware. Butts shall be wrought steel not less than .130 inches thick, five knuckles, fast brass pin butt, similar to Type 2029P and cut to fit the door and supporting frame; one leaf full welded to the door and the other leaf secured by 3 counter sunk machine screws. Furnish 3 butts 4 inches high for each door.

(8) Lock shall be mortise type cylinder lock suitable for wire mesh door, operated from the outside by key only and from the inside by knob and similar to Federal Specification FF-H-106a, Type 183 with knob and rose. Master key with project master key system.

e. Clothes Hanging Poles shall be 1 inch round galvanized steel pipe, to be one quarter inch shorter than the length of the closet between walls and to be supported in holes bored in the wood rail furnished and installed under the CARPENTRY AND MILLWORK DIVISION of the Specifications. Furnish one pole for each coat and each clothes closet.

f. Lintels. Steel lintels shall be provided for all square head openings in masonry where other lintels are not indicated on the drawings. The lengths of the bearing at each end of the lintel shall not be less than 1 inch per foot of span and in no case less than 6 inches. Built up lintels shall be bolted or riveted together with separators to suit wall thickness.

g. Pipe Rails unless otherwise indicated on the drawings shall be 1-1/2 inch internal diameter standard weight galvanized steel pipe. Pipe rail posts shall be set in pipe sleeves to a minimum depth of 6 inches and set in lead or cement or attached to concrete less than 7 inches thick or to metal by flanged fittings and fastenings approved by the Local Authority.

(1) Pipe rails shall be flush type with flush welded fittings except floor flanges and concealed splices. Welds shall be smoothed before painting.

h. Pipe Columns. Pipe columns shall be of extra strong steel pipe and provided with steel base and cap plates and anchorage as indicated.

(1) Pipe Columns at Front Entrance porches shall have brackets or lugs welded on for attachment of the wire mesh panels as shown.

i. Porch Division Panels shall be of wire mesh set in channel construction and with pipe handrail all as shown on the drawings. The entire assembly shall be galvanized after fabrication. All fastenings for supporting at the wall with lead shields and at the pipe columns shall be galvanized.

j. Memorial Tablet. Provide a cast bronze tablet in accordance with design indicated on the drawings anchored to building with concealed non-ferrous metal fastenings. Borders and letters shall be polished and background stippled.

7. PAINTING

a. Shop Painting. All iron and steel work shall be thoroughly cleaned of loose scale, rust, and foreign matter and be dry when painted. Except where encased in concrete and excepting edges and surface areas adjacent to edges to be field welded, all work shall be given one shop coat of paint, applied evenly and thoroughly and well worked into the joints and open spaces.

(1) Interior iron and steel work that will be exposed to view shall be prime coated with iron oxide paint or synthetic paint primer. All other steel and iron work shall be prime coated with red lead. Paint on exposed surfaces shall be thoroughly brushed out and not allowed to run or sag or fill the corners.

(2) Parts inaccessible after assembly shall be given 2 coats.

b. After erection, steel not encased in concrete shall have field connections and abraded places touched up with shop coat of paint.

DIVISION 12

LATHING AND PLASTERING

1. SCOPE

This division includes interior lathing, furring, plastering, and related items required to complete the work as indicated on the drawings, and as specified, except wood furring and wood grounds which are specified in the division CARPENTRY AND MILLWORK.

a. Plastered ceilings throughout. See Finish schedules.

b. Plastered walls where required by the finish schedule and indicated on the plans.

2. MATERIALS

a. Metal lath shall be expanded metal lath conforming to Federal Specification QQ-B-101c Type F.

b. Accessories

(1) Tie wire shall be annealed, No. 16 or No. 18 gage galvanized steel, monel metal, or other corrosion resistant metal of sufficient strength for the purpose as approved by the Local Authority.

(2) Cornerites shall be 2.5 pound flat expanded metal lath bent at right angles to form not less than 3 inch legs on each side.

c. Gypsum lath shall conform to Federal Specification SS-P-431a. Gypsum lath shall be 3/8 inch thick for 16 inch span and lath may be plain or perforated.

d. Gypsum plaster shall conform to Federal Specification SS-P-402 Type N (neat) fibered with sisal for application over metal lath.

e. Gaging Plaster (calcined gypsum) shall conform to Federal Specification SS-P-402, Type G.

f. Lime shall be hydrated lime or finely pulverized quick lime.

(1) Hydrated lime shall conform to ASTM Specification C206-49, Type S.

(2) Pulverized quick lime shall conformto Federal Specification SS-Q-351, Type C. All material shall pass a No. 20 sieve and not less than 90 per cent shall pass a No. 50 sieve.

(3) Aged lime putty made from lump lime may be used provided it meets the requirements for hydrated lime. The putty shall be made by a firm regularly engaged in supplying the trade with lime putty in bulk, and in a plant fully equipped with proper machinery and storage capacity; the plant and method used shall be subject to inspection and approval by the Local Authority.

g. DELETED

h. Sand shall conform to ASTM Specification C35-39.

i. Light weight aggregate may be used in lieu of sand for scratch and brown coats only. In making a sieve analysis of light weight aggregate under ASTM Specification C136-46, a 50 grain sample shall be used. When such a determination is made for bagged materials samples shall be obtained by mixing and then quartering. Where a "Rotat" or other mechanical sieve device is used, the sieving time shall be five minutes.

(1) Vermiculite shall be a mica mineral, properly expanded by a heating process, conforming in particle size to the requirements of the standard specifications for sand for plaster. The weight shall be not less than 7 1/2 nor more than 10 pounds per cubic foot, as determined by measurement in a cubic foot box, using the shoveling procedure outlined in the Standard method for Unit Weight of Aggregate. ASTM Specification C29-42.

(2) Perlite shall be a volcanic rock properly expanded by a heating process conforming in particle size to the requirements of the standard specification for sand for plaster, except that the minimum percentage retained on a

No. 100 (149 micron) sieve shall be decreased from 95 to 90 per cent. The weight shall be not less than 7-1/2 nor more than 15 pounds per cubic foot as determined by measurements in a cubic foot box, using the shoveling procedure outlined in the Standard Method of Tests of Aggregate, ASTM Specification C29-42.

j. Water shall be clean, fresh and free from alkali or such amounts of mineral and organic substances as would affect the set of the plaster.

k. All manufactured materials shall be delivered in the original packages, containers, or bundles bearing the name of the manufacturer and the brand.

l. Protect plaster and all cementitious materials against dampness. Store off the ground, under cover and away from sweating walls and other damp surfaces.

m. Protect metal goods against rusting.

n. Affidavits. Furnish affidavits from manufacturers certifying that materials delivered to the job conform to the requirements of these specifications.

3. SAMPLES

Samples, as listed below, of materials proposed by the Contractor for use in the work shall be submitted to the Local Authority for approval:

Metal Lath	12 sq. ft.
Tie Wire	1 lb.
Cornerites	6 lin. ft.
Gypsum Lath	12 sq. ft.
Sand	2 cu. ft.
Light Weight Aggregate	4 cu. ft.

4. INSTALLATION OF LATH AND ACCESSORIES

a. Fur over chases, recesses, pockets, and other gaps. Provide necessary clips to fasten metal lath to bring plaster to lines indicated on the drawings. Furring shall be fastened securely in place.

b. Metal lath where required for furring chases shall be laid with sides of sheets lapped 1/2 inch for expanded metal lath, and end of sheets lapped 1 inch. Laps shall be made with metal to metal contact.

(1) Bridge joints, between differing materials which are to be plastered, with expanded metal lath.

(2) Lap expanded metal lath 4 inches beyond sides of chases and recesses.

c. Gypsum lath shall be applied to the under side of furring strips (furnished under CARPENTRY AND MILLWORK DIVISION) with the long dimension at right angles to the furring members. Cross joints shall be broken in each course. Gypsum lath shall be nailed with 4 nails to each furring strip 5 inches apart and 3/8 inch from the edge. Nails shall be 13-gage, blued 19/64 inch flat head, smooth diamond point nails, 1-1/8 inches long for 3/8 inch lath driven so that the underside of the nail head will be flush with lath. The lath shall be applied to the entire ceiling area of buildings before constructing interior masonry partitions, except that it shall not be carried across walls forming dividing partitions between dwelling units, where a transverse joint of approximately 3/4" width shall be provided centered over the dividing walls.

d. Cornerites shall be installed on all interior angles where different plaster bases occur on each surface. Secure along each edge at 16-inch intervals.

5. PROPORTIONING AND MIXING

a. Plaster mixes shall be proportioned according to the following table.

NEAT GYPSUM PLASTER AND SAND

	Neat Gypsum Plaster	Sand	
		Volume	Weight
Scratch coat	100 lbs.(1.54 cu.ft.)	2.0 cu.ft.	200 lbs
On lath	1 cu. ft.	1.3 cu. ft.	130 lbs
Brown coat on lath	100 lbs.	3.0 cu.ft.	300 lbs
& all coats on masonry	1 cu. ft.	1.95 cu.ft.	195 lbs
Doubled up on lath	100 lbs.	2.50 cu.ft.	250 lbs
Both coats	1 cu. ft.	1.63 cu.ft.	163 lbs*
Smooth white coat 3/	1 part gaging plaster by volume	3 parts of lime putty by volume	

3/ Factory prepared finishes which require the addition of water only may be used at the option of the Contractor, when approved by the Local Authority.

NEAT GYPSUM PLASTER AND LIGHT WEIGHT AGGREGATE

	Neat Gypsum Plaster	Lt. Wt. Aggregate
Scratch coat on lath	100 lbs.	2 cu. ft.
Brown coat on lath & all coats on masonry	100 lbs.	3 cu. ft.
Doubled up on lath both coats	100 lbs.	2-1/2 cu. ft.

b. Mixing. Measurement by volume, except for finish coats, shall be by barrow or buggy or other containers of known capacity, or by manufacturers' packages or any similar method of equal accuracy for maintaining consistent proportions. No lumps or caked or frozen material shall be used. No mortar that has commenced to set shall be retempered or used. Mixing equipment, boxes, machines and tools shall be clean.

The materials shall be proportioned as specified with such variations only as will, under prevailing conditions, improve the quality of the mortar and are approved by the Local Authority. Mixing shall be continuous until complete and the ingredients are evenly distributed.

(1) Hand Mixing. Plaster and aggregate shall be mixed dry to a uniform color at one end of the box, hoed into the water at the other end, and thoroughly mixed.

(2) Machine mixing shall be in a machine made for this purpose. Aggregate shall be added at the job. The following cycle of operation shall be followed: while the mixer is in continuous operation put in approximate amount of water; add approximately half the amount of aggregate; add all the plaster; add the remainder of the aggregate; mix, adding water if necessary.

(3) Factory proportioned plaster shall be mixed as follows: put in approximate amount of water, add aggregate and mix adding water as necessary.

(4) Overmixing of light weight aggregate shall be avoided. Mix light weight aggregate in accordance with manufacturers' directions.

c. Hydrated lime shall be converted to lime putty in accordance with the printed instructions of the manufacturer.

6. THICKNESS

The minimum thickness of plaster on various materials shall be:

On metal lath	3/4 inch
On gypsum lath	1/2 inch
On masonry	5/8 inch

7. PREPARATION FOR PLASTER

a. Temperature. Plaster shall not be applied to materials that contain frost. A minimum temperature of 40 degrees F. shall be maintained in the building for an adequate period prior to the application of the plaster, while plastering is being done, and until it is dry.

b. Masonry surfaces to be plastered shall be clean, and free from loose particles, grease, oil, acid or foreign matter. When necessary excessive suction of masonry shall be reduced by wetting.

c. Gypsum lath shall not be wetted before applying plaster.

d. DELETED

e. All surfaces shall be carefully examined and the Local Authority notified of any and all unsatisfactory conditions before the plaster is applied. Applications of plaster shall not proceed until such unsatisfactory conditions have been satisfactorily remedied.

f. Metal accessories shall be carefully examined to see that they are straight, plumb, square or true to the required angles as the case may require and all defective work or material replaced or corrected before plaster is applied.

8. APPLICATION OF PLASTER

Plaster shall be applied to surfaces, indicated to be plastered, to true straight lines, level and plumb with corners square. Compact brown coats by floating the sur-

face. Trowel finish coats to a hard finished surface. Plaster on walls and partitions, except finish coat, shall extend to the floor and all spaces between grounds shall be filled.

a. Plaster grounds for brown coat including bond plaster on concrete shall be brought into good line and level to establish the exact surface of the brown coat and allowed to set up, and used as a guide for rodding the brown coat.

b. Number of Coats.

Plaster on masonry and gypsum lath shall be 2-coat work or 3-coat work.

(1) Two coat work. Base (first) coat shall be applied with sufficient material and pressure to form good bond on gypsum lath or masonry as the case may be, and to cover well. Then material of the same proportions shall be doubled back to bring the plaster out to grounds, struck to a true surface and left ready to receive the finish coat.

(2) Three coat work. The scratch (first) coat shall be applied with sufficient material and pressure to form good bond and to cover well, and then be scratched to rough surfaces. The brown (second) coat shall be applied after the scratch (first) coat has set firm and hard, brought out to grounds and straightened to a true surface and left ready to receive the finish (third) coat.

c. DELETED

d. Finish coats shall be applied to a partially dry brown coat or to a thoroughly dry brown coat which has been evenly wetted by brushing or spraying. The use of excessive water shall be avoided.

(1) Gypsum lime putty trowel finish shall be applied over the base course, laid on well, doubled back and filled out to true even surfaces. The general thickness shall be 1/16 inch to 1/8 inch. The finish shall be allowed to draw a few minutes and then well troweled with water to a smooth finish, free from blemishes or irregularities.

(2) Prepared gypsum trowel finish shall be applied in accordance with manufacturer's directions. The general thickness shall be from 1/16 inch to 1/8 inch. It shall be well trowelled with water to a smooth finish free from blemishes or irregularities.

9. CURING AND VENTILATION

During the application of each coat of plaster the exterior openings shall be adjusted for proper continuous ventilation to control the drying out and curing of the plaster until it is dry. Plaster shall be protected against rapid drying and frost.

10. PATCHING

Point up around trim and other set work. Patch and point all cracks and defects. Patching plaster shall match and finish smooth and level with adjoining plastering.

DIVISION 13

CARPENTRY AND MILLWORK

1. SCOPE

This division includes all carpentry and millwork and related items required to complete the work indicated on the drawings and specified except that forms for concrete are included in the division CONCRETE. Refer to SPECIAL CONDITIONS, SECTION 9, for Options.

2. MATERIALS

a. Softwood lumber shall conform to Federal Specifications MM-L-751c.

b. Hardwood lumber shall conform to Federal Specifications MM-L-736.

c. Grade Marking. "Grade Mark", "Trade Mark", and "Mill Identification Mark" of the associations having jurisdiction shall appear on each piece of standard yard dimension lumber (not boards), except that shipments may be accompanied by a certificate of inspection identifying the shipment and certifying compliance with the requirements of this specification.

d. Moldings shall be stock pattern. Trim shall conform to details on the drawings except that stock trim of the same general type fulfilling all functions of the work will be accepted.

e. Plywood. Douglas fir plywood shall conform to U. S. Department of Commerce, Commercial Standard CS-45-48 and shall be branded or stamped with type and grade. Hardwood plywood shall conform to U. S. Department of Commerce, Commercial Standard CS-35-49 and shall be branded or stamped with type and grade.

f. Moisture content of structural lumber 2 inches and less in thickness and boards shall not exceed 19 percent. Finish lumber and millwork shall not exceed 12 percent moisture content.

g. Sizing. Surface lumber 4 sides to conform to Simplified Practice Recommendation SR-16-53.

h. Dimensions specified for lumber are nominal except as may be otherwise noted.

i. Work to detail where indicated on the drawings or as required by conditions.

3. GRADES AND SPECIES

a. Structural lumber for framing light roof trusses not over 2 feet on center, joists, rafters, lintels, beams, plates and members stressed in bending, compression or tension shall be common dimension of the following species and minimum grades:

Fir	Douglas, West Coast 1/ W.C.L. Rules	No. 2
Fir	Douglas 2/ W.P.A. Rules	No. 1
Pine	Southern, Longleaf	No. 2
Pine	Southern, Shortleaf	No. 2

b. Roof sheathing shall be common, any of the following species and minimum grades:

Fir	Douglas - W.P.A. Rules	No. 3
Fir	Douglas - W.C.L. Rules	No. 2
Pine	Southern	No. 2
Plywood	Douglas Fir	Interior type grade C-D

c. Miscellaneous. Furring, grounds, bridging, and blocking shall be suitable for the purpose intended.

d. Exterior trim (except wood ceilings and soffits), and frames for doors, shall be any of the following species and minimum grades:

Fir	Douglas - W.C.L. Rules	D Finish V.G.
Fir	Douglas - W.P.A. Rules	D Select & Better V.G.
Pine	Northern White	C Select
Pine	Ponderosa	D Select
Pine	Southern	C
Redwood		A Grade

e. Exterior trim, wood ceilings and soffits:

Plywood	Douglas Fir Exterior Type	Grade A-C

1/ West Coast Lumberman's Association Rules.
2/ Western Pine Association Rules.

f. Interior trim to be painted and shelving shall be any of the following species and minimum grades except as specified herein:

		Trim	Shelving
Fir	Douglas-W.C.L. Rules	D Finish V.G.	No 1 Comm
Fir	Douglas-W.P.A. Rules	D Select & Better V.G.	No 1 Comm
Pine	Ponderosa	D Select	No 2 Comm
Pine	Southern	C	No 1 Comm
Redwood		A Grade	Select Heart
Poplar	Yellow	B Finish	No. 1 Boards

Trim shall not contain defects such as wane or loose knots exposed on edges. Shelving shall not contain defects such as split ends apt to split off easily, or torn grain over 1/16 inch deep, or knots on front edge.

g. Wood Doors

(1) Exterior doors and screen doors shall be fabricated of any of the following species:

Fir	Douglas
Pine	Southern, Longleaf
Pine	Northern, White
Pine	Ponderosa

(2) Interior doors shall have stiles and rails solid of any of the following species:

Fir	Douglas	V.G.
Pine	Southern	
Pine	Ponderosa	

or veneered with any of the high or medium density hardwoods as defined in Commercial Standard CS-35.49.

4. WOOD PRESERVATIVE TREATMENT

a. Millwork: Door frames and doors in exterior walls, and door screens shall be fabricated from all heart lumber or be preservative treated and bear the Seal of Approval of National Woodwork Manufacturers Association, or be accompanied by an affidavit from manufacturer identifying each shipment and certifying that they have been preservative treated in compliance with minimum standards established by National Woodwork Manufacturers Association. Brush coat cut surfaces with a heavy application of the preservative used for treatment.

b. Structural Lumber, Grounds, Framing: Structural lumber, framing, and grounds subject to deterioration* by contact with masonry, moisture, etc., shall be given a pressure preservative treatment which shall conform to Federal Specifications TT-W-00571d. (* - within 3 feet of the floor)

5. STORAGE AND PROTECTION

a. Pile lumber to insure proper ventilation and drainage.

b. Protect millwork against dampness during and after delivery. Store in well-ventilated building and where not exposed to extreme changes of temperature and humidity. Wood doors shall be stored in a flat position one above another on solid level supports with air circulation excluded from top and bottom surfaces.

c. Do not store or install millwork in any building until plaster work is dry.

6. GENERAL

a. Layout, cut, fit and erect framing, sheathing, bridging, blocking and all items of trim and other carpentry. Do cutting work of carpentry for other trades. Brace, plumb and level all members and secure with sufficient nails, spikes and bolts to insure rigidity.

(1) Defects which render any piece unable to satisfactorily serve its intended purpose, including crooked, warped, bowed or otherwise defective material, even if within the limits of the grade specified, shall be cut out or the piece replaced.

b. Chimney Clearance. Provide 2 inch clearance between chimneys and wood construction, except that trim and grounds may be 4 inches (minimum) away from flue lining.

7. FRAMING

a. Roof

(1) Set plates on masonry walls and wedge, level and bed in mortar.

(2) Bolt plates to masonry walls at corners, and at intermediate points approximately 3 feet apart with 1/2 inch diameter bolts 10 inches long unless otherwise indicated on the drawings.

(3) Roof Trusses. Roof trusses (or trussed rafters) shall be constructed with precut and carefully fitted members assembled in jig frames to insure uniformity. Trusses as constructed shall conform to dimension within a tolerance of 1/2 inch for length and 1/4 inch for height, and shall be trimmed as necessary to conform to finished dimension within a tolerance of 1/4 inch for length and 1/8 inch for height. Connections shall be drawn up tight and nails driven flush.

(a) Jigs shall be steel plates supporting one entire truss, not less than 3/16 inch thick welded into a single sheet and supported in a level plane on rigid blocking, or be a timber platform so constructed as to prevent variation of dimension over the tolerance specified for trusses. To position the truss members, provide blocks of 2 x 2 inch steel angles fastened to the jig platform with not less than two 3/8 inch bolts not less than 6 inches apart.

(b) Store trusses in a vertical position clear of the ground on solid blocking located at panel points.

(c) Erect trusses accurately in position perpendicular to wall plates. Nail trusses to plates with two 10d nails each side of each end.

(d) Straighten truss chords by nailing temporary spacers as necessary to top and bottom chords before applying roof sheathing or furring strips.

(e) Anchorage. Anchor roof trusses to wall plates with 16 gage x 1 inch strap iron or equivalent approved metal clips 4 feet on center. Nail with three 8d. nails each end.

b. Roof sheathing shall be nominal 1 x 6 or 1 x 8 inch tongued and grooved boards, or 5/8 inch plywood, for 24 inch spans.

(1) Apply sheathing boards at right angles to framing, with broken joints and face nail each board with two 8d nails to each support.

(2) Apply plywood roof sheathing with surface grain at right angles to main supports, butt joints over supports and solid blocking under edges. Break joints. Nail with 6d nails spaced 6 inches around edges and 12 inches on intermediate framing.

(3) Wood cants, crickets and water sheds shall be provided as required for installation of roofing materials.

8. WOOD GROUNDS

Provide wood grounds, strips and blocking, as indicated on the drawings or required by conditions, of thickness and shape required for plaster, wood trim, and to secure roofing and other work or equipment in place. Wood blocking or nailers on steel shall be bolted; fasten wood grounds, furring and other engaging woodwork to wood, concrete and masonry with approved types and sizes of nails, ties or inserts spaced to provide rigid secure supports.

9. WOOD CENTERS

Wood centering for masonry arches or soffits shall be framed, braced and allowed to remain in position until masonry has firmly set.

10. WOOD DOOR BUCKS

Provide wood bucks of nominal 2 inch thick stock of widths required, where indicated. Nail not less than three 1/4 to 1 inch metal strap anchors 8 inches long with 2 inch hooks on back of each jamb of bucks to be built into masonry.

11. WOOD NAILERS

Wood nailers in concrete or masonry of dimensions where required to carry out the intent of the drawings shall be sound, all heart of cedar, redwood or cypress. Align tops to levels required.

12. TEMPORARY ENCLOSURES AND PROTECTION

Temporary enclosure of doors, windows and other exterior openings shall be provided when necessary to meet conditions specified, maintained in good repair, and removed when no longer required. Protect door and window frames from traffic and cut stone from mortar drippings.

13. ROUGH HARDWARE

Provide and install all rough hardware for proper installation of carpentry and millwork. Nails, spikes, screws, bolts and similar items shall be of types and sizes sufficient to draw and rigidly secure members in place.

14. MILLWORK AND TRIM

Install exterior and interior millwork and finish trim with tight joints securely nailed. Fasten interior trim with finishing nails and exterior trim with galvanized siding nails. Set exposed heads of finishing nails for putty. Sand interior woodwork as necessary to remove irregularities and machine marks. Leave work free from defects and blemishes.

a. Joints shall be tight and formed to conceal shrinkage. Make outside joints to exclude water and set in lead paste. Door trim shall be in single lengths without splicing; corners shall be mitered unless otherwise indicated. Running trim shall be in long lengths and jointed only where solid fastenings can be made. End joints in built-up members shall be well distributed. Miter exterior corners and cope interior angles. Where required, scribe woodwork to plaster and other adjacent work.

b. Prime surfaces in contact with concrete or masonry with one coat of paint specified for exterior priming (see Division PAINTING) before setting exterior finish and millwork, and door frames.

15. DOOR FRAMES

a. Fabricate exterior frames 1-5/8 inch thick with rabbets for doors and screens and staff beads as detailed. Heads and jambs shall be housed together.

(1) Set frames occurring in exterior masonry walls, after masonry is laid securely nailed to the rough bucks. Plumb and brace frames to prevent distortion.

16. WOOD DOORS

Wood doors shall conform to the requirements of the Commercial Standards and grades listed with each type below except as otherwise specified. Grades marked with the subscript $_1$ shall be used for painted doors only.

a. Exterior doors C.S. 120-53 Grade 1F.

Exterior doors shall be 1-3/4 inches thick. Panel doors shall have solid stiles and rails. Panels shall be raised as indicated. Panels shall be set in place without glueing or nailing. Provide loose wood molds for glazing.

b. Interior doors C.S. 73-51 grade A, Hollow core
C.S. 120-53 grade 1, Hollow core
C.S. 200-55 grade "good" Hollow core

Interior doors shall be 1-3/8 inches thick unless otherwise indicated.

c. Screen doors C.S. 120-53 Grade No. 1.

Screen doors shall be made to design shown on the drawings with stiles and top rail not less than 3-5/8 inches, cross rails not less than 5-5/8 inches, and bottom rail not less than 7-1/2 inches wide. The top rail and cross rails shall have not less than two dowels at each end. The bottom rail shall have not less than 3 dowels at each end.

(1) Screen cloth shall be 16 x 16 or 18 x 14 aluminum wire conforming to Federal Specification RR-C-451a, Type G.

(2) Furnish guard grilles on the inside of panels below the lock rail of 16-gauge flat woven wire mesh or 1-1/2 inch flattened expanded metal mesh, 14-16 gauge, both galvanized after fabrication.

d. Install wood doors including screen doors after both surfaces have been sealed or primed as specified in the division PAINTING. Doors shall have from 1/8 to 3/16 inch clearance from sides and head depending on the moisture content of the doors, the type of door and average local humidity changes from summer to winter. Doors shall clear floors by 3/4 inch and thresholds by 3/16 inch. Doors shall hang plumb and true with stops fitted closely. At completion, doors shall be free from warp with joints undamaged and surfaces in satisfactory condition for painting. Set hardware on screen doors so that such doors are interchangeable.

17. EXTERIOR COVERING

a. Exterior wood eave and porch soffits shall be 3/8 inch thick Douglas fir plywood, laid with butt joints over bearing and with solid blocking under edges. Nail plywood ceiling 6 inches on center at edges and 12 inches on center at intermediate supports.

b. Cornice. Frame lookouts as detailed. Brace and miter or cope cornice members at angles and assemble to form protection to vertical joints.

(1) Vent openings in soffits at eaves and in ridge ventilators shall be covered with 8 mesh aluminum screens. Lap opening at least 1/2 inch and tack or staple in place on 6 inch centers or as indicated on the drawings.

18. INTERIOR TRIM

a. Trim shall be as indicated on drawings.

(1) Casings shall be set 1/4 inch back from face edge of jambs and head and nailed to finish and to rough jambs. Carefully join and rigidly fasten joints.

(2) Wood rail 3/4 x 3-5/8 inch shall be installed around inside walls of bathrooms and toilets for attachment of accessories. Securely fasten strips to bearings.

b. Closets. Install a 4 inch hook strip around 3 sides of each clothes closet and two shelves of nominal 12 inch wide boards, lengthwise of closets. Support bottom shelf on hook strip and top shelf on cleats. Provide intermediate supports for shelves more than 5 feet in length. Space linen and utility closet shelves as indicated and support on nominal 2 inch cleats. Install one clothes hanger pole lengthwise (or as shown) in each closet and one curtain pole at open closet fronts (see Division MISCELLANEOUS AND ORNAMENTAL IRON for hanging poles and HARDWARE-BUILDERS for curtain rods).

(1) Coat and hat hooks shall be provided and installed where directed. (see Division HARDWARE-BUILDERS)

c. Scuttle and access doors shall be installed where indicated on the drawings. Construct with frame, trim and hinged 5 ply 1/2 inch plywood or 3/4 inch panel door.

19. KITCHEN CABINETS

a. Wood kitchen cabinets shall be as indicated on the drawings.

(1) Fabricate from sound, kiln-dried lumber with frames, rails, stiles and intermediate members not less than 3/4 inch thick and of sufficient width to insure sturdy rigid construction.

(2) Base cabinet work tops and splash shall be approximately 7/8 inches thick, and made of 1/16 inch thick high pressure laminate conforming to the standards of the National Electrical Manufacturer's Association and plywood with close grain face veneer of birch, poplar, or Phillipine mahogany and moistureproof backing sheets as recommended by the plastic manufacturer. Glue and methods shall be as recommended by the plastic manufacturer. Bind all edges and furnish cove of stainless steel at back and end wall splash, or in lieu of metal cove and counter edge nosing may be pre-formed of the laminate material.

(3) Shelves may be of 5 ply plywood or solid stock not less than 3/4 inch thick. Let shelves into ends and glue with all corner joints nailed. Support open shelving on cleats securely fastened to adjacent construction.

(4) Doors shall be of 5 ply plywood or hard pressed fiberboard not less than 1/2 inch thick, edges sanded smooth, or paneled with solid stiles and rails with 3 ply plywood panel.

(5) Drawer fronts shall be of straight grained stock 3/4 inch thick. Slide drawers on hardwood slides with stops. Partition one drawer for silverware.

(6) Erect cabinets straight, level, and plumb. Securely anchor in place with finish moldings and fillers to fit cabinet to walls and ceilings.

(7) Shop drawings shall be furnished correctly dimensioned to fit spaces as erected, and approval by Local Authority shall be obtained before fabrication.

(8) Prefabricated wood kitchen cabinets, shelving, work tables, and counters (factory assembled complete with hardware) may be furnished if equal to requirements specified herein and if variations standard with manufacturer are approved by Local Authority.

20. OFFICE

a. Counter. Construct wood counter in administration offices in accordance with applicable specified requirements for wood kitchen cabinets as to shelves, frames, doors, drawers and hardware.

(1) Frames shall be assembled with full mortise and tenoned, or doweled, and glued joints.

(2) Counter tops shall be of 5/8 inch thick plywood covered with 1/8 inch thick linoleum conforming to Federal Specifications LLL-L-359 or 367 of color approved by Local Authority, cemented to counter top. Bind edges with stainless steel edging strip.

(3) Gates for counters shall be 3 ply veneer panels set in 1-1/16 inch thick rails and stiles, mortised, tenoned and glued.

(4) Foot rails shall be of iron pipe with standard fittings. Secure in place with screws in wood or expansion bolts in masonry or concrete.

(5) Guard screens shall be provided for top of counters, not less than 20 inches high unless otherwise shown of 1/4 inch plate glass set in non-ferrous frames, and hinged non-ferrous metal wickets in openings in front of cash drawer.

21. WORK BENCH

Construct work bench to details shown, to be of No. 1 common yellow pine, and assembled with bolts, lag screws, and wood screws of proper size and number to provide a rigid and permanently substantial working surface.

22. MEDICINE CABINETS

a. Cabinets shall be recessed type metal with mirror door over lavatory in each bathroom, with any dimension not less than as follows:

Wall Opening	13-1/4 inches wide x 18 inches high
Mirror Size	16 inches wide x 22 inches high
Depth of Cabinet	3-1/2 inches

(1) Cabinets shall be made of not less than 22-gauge cold rolled steel or galvanized steel. Galvanized cabinets shall be in one piece formed or welded. Block steel cabinets shall be welded or one piece formed and welded or in one drawn seamless piece. After fabrication, seams shall be sealed and ground smooth, and cabinets bonderized or parkerized. Cabinets shall be finished with one coat of oven-dried white enamel. Provide cabinets with not less than two glass shelves with bulb shaped front edges.

(2) Mirrors shall be made from Grade A window glass and conform to Commercial Standard CS 27-36. Set mirrors, properly cushioned, in stainless steel frame approximately 1/2 inch wide. Fit door with continuous hinge not less than 12 inches long or two hinges not less than 2 x 1 - 9/16 inches x .065 inch thick metal, friction catch, stop and pull.

b. Install cabinets in a 2 x 4 wood frame or between wood studs on center line of lavatories with center of mirror 5 feet 0 inches above finished floor line. When cabinets are located back to back, provide a 1/2 inch fiber insulating board filler between cabinets, full size of cabinet.

23. BATHROOM ACCESSORIES. For each bathroom and toilet room provide manufacturers standard accessories of matching design and finish in solid substantial easily cleaned patterns. Accessories shall be free from defects that will detract from their appearance or utility.

a. Provide accessories as follows:

(1) Paper holder with a wood or metal roller with a spring insert (one each water closet).
(2) Two 24-inch towel bars with supporting brackets.
(3) Combination tumbler and tooth brush holder (one for each lavatory).
(4) Soap dish, non-draining type (one for each lavatory).
(5) Robe hook, double, one for each room.
(6) Combination soap dish and grab bar (one for each bath tub).

b. Materials. Accessories shall, at the option of the contractor, be white hard glazed vitreous china, or virgin (for soap and grab only) zinc base die cast alloy conforming to ASTM Standard B86-52, No. XXIII or XXV, or cast or forged brass. Die cast or brass accessories shall have bright polished chromium finish. Plates for attaching accessories to wood, if used, shall be zinc or cadmium plated steel of strength sufficient to develop the strength of the accessory. Screws shall have exposed heads finished to match the accessory.

Towel bars shall be not less than 5/8" round, square, hexagon or octagon stainless steel or polished chromium plated brass, or polystyrene or lucite with chromium plated brackets, or white plastic covered hardwood not less than 3/4" square, with surface mounted china brackets only.

c. Types. Combination soap dish and grab bars shall be recessed type. Other accessories shall be surface mounted.

d. Fastenings. China recessed accessories shall be fastened in place by embedding not less than one inch in plaster of paris or portland cement mortar. Provide necessary blocking to support the assembly in framed partitions. Metal recessed accessories shall be fastened with screws to concealed blocking. Surface mounted accessories shall be mounted on concealed plates or be attached directly by screws. Fastenings shall be solid, substantial and amply strong to meet the requirements of normal use.

e. Erect accessories in place with items a(1) to a(4) inclusive mounted on wood rail in bathroom, Item a(5) on bathroom door and item a(6) on wall above bathtub all as more particularly located on the drawings or directed by the Local Authority. Provide necessary grounds, fastenings, and blocking.

24. HARDWARE-BUILDERS

a. Materials (see division HARDWARE-BUILDERS). Receive, store and be responsible for builders and cabinet hardware. Properly tag, index and file keys in key cabinet as directed. Deliver all keys locking the key cabinet at completion of work.

(1) Fit all hardware accurately, apply securely and adjust carefully.

(2) Door knobs shall be centered 38 inches above floor and center door pulls 45 inches above floor. Leave in working order free from defects.

DIVISION 14

THERMAL INSULATION

1. SCOPE

This Division includes all labor, material, equipment, and related services required to furnish and install all insulation indicated on drawings and as specified.

2. EXCLUDE FROM THIS DIVISION

Items of similar and/or related work listed in this paragraph are specified elsewhere in Divisions noted.

a. Insulation of mechanical work - "Mechanical Division".

b. Edge insulation of concrete slabs on the ground - "Division #4".

3. GENERAL REQUIREMENTS

a. Thermal resistance. Install insulation with thermal resistance (1/C) of 11.1 in ceilings.

b. Criteria. Thermal resistance of insulation, except for air spaces, shall be calculated in accordance with formulae and information in the current edition of the Heating, Ventilating, and Air Conditioning Guide. The thermal resistance of air spaces shall be calculated in accordance with formulae and information in the Housing and Home Financing Agency's Research Paper 32 entitled "The Thermal Insulation Value of Air Spaces".

4. INSULATION MATERIAL

a. Insulation shall be moisture repellent and resistant to vermin and decay; manufactured to guard against delamination, separation from membrane facings; and to resist damage during handling and installation. Flammable loose fill insulation shall meet the fire resistance requirements of Federal Specifications HH-I-528a.

(1) Loose fill insulation shall conform to Federal Specification HH-I-521c, type III.

(2) Cotton insulation shall conform to Federal Specification HH-I-528a.

5. AFFIDAVITS

Furnish affidavits from manufacturers certifying that materials delivered to the job conform to specification requirements.

6. SAMPLES

Samples of the following listed materials proposed for use in the work shall be submitted for approval by the Local Authority.

Loose fill insulation 3 cu. ft.

Submit with each sample, the manufacturers' rated "conductance factor" and water vapor permeability.

7. INSTALLATION

a. General. After all piping and wiring is in place, install and support insulation in position indicated on drawings, coordinated with and adapted to the framing indicated on the drawings.

(1) Loose fill insulation in ceilings shall be installed to required thickness between framing members over a separate vapor barrier installed back of the lath. Remove excess fill which interferes with ventilating slots at eaves. Fill all spaces around and against pipes, ducts, trimmers, etc.

8. AT COMPLETION, insulation or vapor barriers that have become torn, displaced, water soaked, or otherwise damaged shall be removed and replaced with new acceptable material.

DIVISION 15

WEATHERSTRIPPING

1. SCOPE

This division includes weatherstripping and related items required to complete the work indicated on the drawings and specified.

a. Weatherstrip jambs, heads and sills of all exterior wood doors including thresholds.

2. MATERIALS

a. Materials for weatherstripping shall be spring strips of cold rolled spring bronze. Nails for bronze weatherstrips shall be copper and bronze.

b. Sheet metal shall be the following minimum thicknesses:

Spring bronze strips .0089 inch (31 B & S)

c. Thresholds shall be extruded brass or aluminum alloy, standard interlocking type, 4½ x 7/8" dimension, as shown on the drawings.

3. SAMPLES

A twelve inch sample of each item, together with cuts or drawings showing the details of application, shall be submitted for the approval of the Local Authority before installation.

4. GENERAL REQUIREMENTS

a. Weatherstrips shall form a weathertight seal at every point when the opening is closed and shall adjust themselves to the swelling, shrinkage and warping of doors and frames, without impairing their efficiency or the easy operation of the doors.

b. Spring strips shall have hemmed edges and be not less than 1 1/4 inches wide. Threshold weatherstripping shall be of spring bronze as specified, tension strip, and for inswinging doors shall clear the floor not less than 5/8" throughout the full swing.

5. TYPE

Door weatherstripping shall be spring bronze type at jambs and heads, and at sills.

6. INSTALLATION

Weatherstripping shall be installed so as to permit doors to operate freely and close tightly and provide for normal expansion of the woodwork. Machine woodwork as necessary without injurious cutting. Nail door weatherstrips 2 inches on center. Set thresholds in calking compound and fasten with not less than three No. 10 non ferrous screws in expansion shields. Hardware shall be left in perfect working order.

DIVISION 16

CERAMIC TILE

1. SCOPE

This division includes ceramic tile and related items required to complete the work indicated on the drawings and specified.

a. Provide ceramic tile floors set in adhesive over concrete slabs and ceramic tile base set in adhesive on wall surfaces, and with marble threshold at door openings.

b. Provide ceramic wall tile, one course high, at back and ends of all bathtubs, and down each end of apron of tubs to the tile base.

c. Provide quarry tile stools at all windows unless otherwise shown or scheduled, of pattern and type indicated on the drawings or specified.

d. Calking at tub rims is specified under Division "Calking".

2. MATERIALS

a. Ceramic tile shall be standard grade in accordance with applicable requirements of Simplified Practice Recommendations SR 61-44. Furnish a properly executed certificate of grade in the standard form of Master Grade certificate. Tile shall be delivered to the work in the manufacturers unopened packages sealed with standard grade certificates, and shall be branded with or have sealed within the shipping marks and other designations corresponding to the information given on the executed certificate of grade.

(1) Floor tile shall be unglazed ceramic mosaic of natural clay or porcelain type, 3/16 inch thick, square, oblong or hexagonal shaped.

(2) Base tile shall be glazed, not less than 4 inches high, with cove bottom and straight top. Furnish square interior angles and rounded exterior corners, both of combination angle and stretcher type.

(3) Wall tile shall be glazed, $4\frac{1}{4}$ x $4\frac{1}{4}$", furnished with square interior corners.

(4) Color of ceramic floor, wall and base tile shall be white.

(5) Thresholds shall be white Georgia or Alabama marble, 7/8 x 2 - inch by the width of the door.

b. Quarry tile shall be of pattern indicated on the drawings, hardburned, weatherproof, acid resistant, sound, clear ringing shale of manufacturer's standard color selected by the Local Authority. Tile shall be not more than 9 inches long and closures shall be not less than 4 inches long, and shop drawings shall be furnished the Local Authority for approval. Tile shall be delivered to the work in the manufacturer's unopened packages, sealed.

c. Portland cement, including white cement, shall conform to Federal Specification SS-C-192.

d. Water shall be clean and free from injurious amounts of oil, acids, soluble salts and organic impurities.

e. Adhesive shall comply with Commercial Standards C.S. 181, Water Resistant Organic Adhesives for Installation of Clay Tile.

f. Aluminum paint shall be a mixture of aluminum paste or powder conforming to Federal Specification TT-A-468 and water-resisting varnish conforming to Federal Specification TT-V-121c mixed, at the rate of 1-1/2 to 2 pounds of aluminum to 1 gallon of varnish and reduced with a volatile thinner as necessary to a brushing consistency.

g. Calking compound shall conform to Federal Specification TT-C-598.

3. SAMPLES

Samples of the following listed materials proposed for use in the work shall be submitted to the Local Authority for approval:

Two panels of floor tile about 12 inches square

Two pieces of ceramic wall tile

Two pieces each of base and fittings to be used

Two pieces of quarry tile for window stools

4. GENERAL REQUIREMENTS

a. Maintain temperature not less than 60 degrees F in rooms to be tiled and until all danger of damage to work by frost is past.

b. Layout of tile on the various surfaces shall be worked out to eliminate cut tile as much as possible. Tile shall be carefully cut to true lines as required. Joints in base shall be approximately 1/32 inch wide and joints in floors shall match the joints in the preassembled sheets of tile. Joints in course of wall tile above tub rim shall be approximately 1/16 inch wide and in quarry tile stools, 1/4 inch.

c. Mortar for setting beds and joints of Quarry Tile window stools shall be type "S" or "N" as specified in Division "MASONRY". The mortar for setting bed shall be thoroughly mixed with as little water as will produce a workable mix.

d. Backing for application of base and wall tile set in adhesive shall be a true plane surface, of the same material used for wall surfaces, free from score marks or grooves, and thickness to be so that face of tile will be in same plane as adjoining face of plaster above.

e. Grout mix for joints shall be a thick soupy mix of neat white cement.

f. Calk full depth off joints between base and door trim with calking compound.

5. INSTALLATION

a. Installation of ceramic tile shall follow all recommendations of the adhesive manufacturer and Specification K-400 of the Tile Council of America.

b. Joints in quarry tile shall be completely filled with mortar, compressed to make a smooth even surface approximately flush and in plane with the tile surface.

c. Grouting and Cleaning. Joints of ceramic tile shall be washed with clean water and then be grouted by screeding and brushing the grout over the tile until the joints are thoroughly filled. Excess grout shall be removed and the tile thoroughly cleaned.

Leave tile work complete and free from cracked, broken or chipped tile. Protect floors with building paper and do not permit foot traffic over tile for at least 48 hours.

DIVISION 17

ASPHALT TILE

1. SCOPE

This Division includes asphalt tile flooring, composition base at office counter, and related items required to complete the work indicated on the drawings and specifications.

2. MATERIALS

a. Asphalt tile shall conform to Federal Specification SS-T-306b, (1/8) inch thick. Unless otherwise indicated on the drawings the tile shall be 9 x 9 inches. Colors will be selected from Color Group B of Simplified Practice Recommendation ST-225-47 issued by the Department of Commerce.

(1) Colors shall be limited to one color in one room. The number of such color selections will be limited to 2.

b. Composition base at Office counter shall be black, coved, set-on type, 4 inches high and 1/8 inch thick, flexible vinyl.

c. Adhesive for tile shall be a bituminous plastic cement, cut-back type for floors and emulsion type for base applied to wood.

d. Furnish affidavits from manufacturers that material delivered to project conforms to the requirements of this specification.

3. SAMPLES

Samples of the following listed materials proposed for use in the work shall be submitted to the Local Authority for approval:

Floor tile.....4 pieces for each color type
Base tile.....2 pieces, 12" long

4. GENERAL REQUIREMENTS

a. General. Inspect the subfloor and do not lay any asphalt tile until concrete subfloors are smooth and even. Sub floors shall be scraped free from foreign material and cleaned. Any sub floor too rough for direct application of the asphalt tile shall have projections removed and depressions primed with

emulsified asphalt thinned to a brushing consistency and filled with a mixture of 1 part of high early strength cement, 2 parts sand and 1 part of emulsified asphalt tempered with water to a plastic mortar as dry as can be placed. Allow filler to set hard.

b. Maintain temperature at least 70 degrees F in place of storage prior to laying. In rooms where tile is to be laid, maintain temperature at least 70 degrees F for 48 hours before and after tile is laid.

c. Installation shall not begin until the work of other trades in the area, including painting, has been completed.

5. INSTALLATION

(1) Spread adhesive with a trowel having triangular notches 1/16 inch deep and wide on 3/16 inch centers. Apply only enough adhesive to hold the tile without rising through joints between tile.

(2) Lay tile when adhesive has set tacky, starting at the center of the room and working toward walls. Embed each tile in adhesive with closely fitted, straight, inconspicuous joints. Lay field tile with grain alternately reversed in a checkerboard pattern. Do not cut tile except at walls or obstructions. Beveled edging strips shall be installed where edges of tile are exposed.

(3) Finished floors shall be smooth and free from buckles, cracks, breaks, waves, and projecting edges, and shall fit neatly at pipes and other installations and obstructions.

6. CLEANING AND WAXING

Clean tile and base with a neutral cleaner when tile has become well seated. Coat floors with a water emulsion wax and buff with a floor polishing machine.

DIVISION 18

PAINTING

1. SCOPE

This Division includes painting and related items required to complete the work indicated on the drawings and specified except the following which are specified in other DIVISIONS of this Specification:

Shop painting of structural metal;
Shop painting of miscellaneous and ornamental metal;
Prime coat on unfinished metal bucks, and trim;
Baked enamel finish on hollow metal toilet doors and partitions, and steel folding doors.

2. GENERAL

The term "Paint" as used herein includes emulsions, enamels, oil paints, sealers, stains, varnishes, and similar coatings.

a. Colors and Specimens for Approval. Colors shall be as selected by the Local Authority. The contractor shall prepare specimens in duplicate, approximately 8 inches by 10 inches, for approval. Wood used to display stains shall be the same kind as that on which the stain is to be used. After approval, one specimen of each kind and color of approved sample will be returned to the contractor. The number of colors required shall be as noted on the schedule of finishes shown on the drawings.

b. Samples of paint for laboratory testing consisting of one quart samples labeled to indicate proposed use shall be furnished from the containers on the work when requested by the Local Authority.

3. MATERIALS

Paint shall be well ground, shall not settle badly, cake or thicken in the container, shall be readily broken up with a paddle to a smooth consistency and have easy brushing properties. Paint shall be ready mixed except that tinting and thinning may be done at the job. The paint shall be suitable for spraying when thinned with not more than 12 per cent by volume of thinner. All paint materials shall be delivered in original unopened containers with labels and tags intact.

Materials not otherwise specified shall conform to the Federal or General Services Administration Specifications which are referred to herein by symbol only as listed below opposite the items:

MATERIAL	SPECIFICATION SYMBOL
Wax; floor, water emulsion	P-W-151a
Drier; paint, liquid	TT-D-651a
Enamel; interior, gloss, tints and white	TT-E-506b
Enamel; interior, semi-gloss, tints and white	TT-E-508
Enamel; undercoat	TT-E-543
Filler; wood, paste	TT-F-336a
Oil; linseed, boiled	TT-O-364
Oil; linseed, raw	TT-O-369
Paint; exterior primer, ready mixed, white	TT-P-25a
*Paint; latex base, interior, flat white & tints	GSA TT-P-29*
Paint; oil interior, flat, wall, tints & white	TT-P-51b
Paint; primer sealer, interior	TT-P-56a
Paint; ready mixed, black	TT-P-61a
Paint; red lead base, Type I	TT-P-86a
Paint; resin-base emulsion, interior, paste, white and tints	TT-P-88a
*Paint; oil, exterior, ready mixed, tints & white	TT-P-102*
Paint; varnish-base for concrete and wood floors	TT-P-146
Pigments in oil; paint colors	TT-P-381a
Primer; paint for zinc coated surfaces	TT-P-641
Sealer; floor, varnish type	TT-S-176a
Stain; wood, exterior	TT-S-706
Stain; wood, interior	TT-S-711
Thinner; paint, volatile mineral	TT-T-291a
Varnish; interior	TT-V-71b
Paint; aluminum - 2 to 2-1/2 pounds of aluminum paste TT-A-468 Type II, mixed with one gallon of varnish	TT-V-81b
Varnish; shellac, Type II, Grade B, Body 3	TT-V-91b
Varnish; spar, water resisting	TT-V-121c
White lead; basic carbonate, paste in oil	TT-W-251b
Zinc-oxide; paste in oil	TT-Z-301

The use of specification symbols in other paragraphs of this Specification shall be understood to require a meterial conforming to Federal or General Services Administration Specifications indicated.

4. GENERAL REQUIREMENTS

a. Maintain temperature of rooms where varnish or enamel is being applied at 70° F. or more and at 50° F. or more during other interior painting. Exterior painting shall be performed when the air temperature is 50° F. or higher and in drying weather.

b. Field painting will not be required on items specified to be completely finished at factory or on aluminum, copper, brass and bronze or on glazing compound in aluminum windows.

c. Vary tints of succeeding coats slightly to permit identification of coats.

d. Ceilings will be painted a different color than walls except that walls and ceilings of bathrooms and Toilet Rooms will be painted the same color.

e. Access doors or panels, registers, pipes, ducts, radiators, and radiator recess linings to be painted shall be painted the same color as adjacent walls or ceilings.

f. Doors to be painted and trim in a room shall be painted one color not the same color as the walls unless specifically required. Metal door bucks shall be painted the same color as the surrounding walls.

g. Prime coated butts and door closers shall be painted to match the door to which they are attached.

h. Back prime exterior wood trim on masonry buildings with one coat of exterior oil paint.

i. Allow paint to dry hard between coats. (2 to 7 days).

j. Wood sash (Doors) shall have a prime coat of exterior oil paint applied both sides before glazing.

k. No painting will be required on exposed wood joists, bridging or framing, unless specifically indicated.

l. Protect all work from damage. Remove paint stains completely from finished work.

m. Paint unfinished exposed surfaces of plumbing fixtures two coats of paint as specified for interior woodwork.

n. Thinning and application of paint shall be in accordance with the printed instructions of the manufacturer.

o. Covering shall be complete. When color, stain, dirt, or undercoats show through the final coat of paint, the work shall be covered by additional coats until the paint is of uniform color and appearance and coverage is complete.

p. Hardware and accessories, fixtures, and similar items placed prior to painting shall be removed, or protected during painting, and replaced on completion of painting.

q. Shelving shall be treated on the bottom and exposed edges as specified for interior wood trim.

r. Sand interior enamel surfaces lightly between coats.

s. Furnish affidavits from manufacturers certifying that materials delivered to the project conform to the requirements of these Specifications.

5. PREPARATION OF SURFACES

a. Surfaces to be painted shall be clean, dry, and free from dirt and frost.

b. Cover knots and pitch streaks with orange shellac, aluminum paint or a resin sealer approved by the Local Authority.

c. Fill nail holes and minor imperfections and cracks between interior trim and masonry with putty between first and second coat. Color putty to match stained work.

d. Steel and iron shall have grease, rust, scale, and dirt removed. Touch up any chipped or abraded places on material that has been shop coated.

e. Galvanized metal to be painted shall be cleaned of all foreign matter with mineral spirits.

f. Plaster surfaces shall have holes and cracks filled with patching plaster before painting. Neutralize free lime in areas less than one month old with a solution of 2-1/2 pounds of zinc sulphate in one gallon of water and allow to dry thoroughly before applying oil paint.

6. EXTERIOR PAINTING

a. Exterior woodwork except wood doors and screen doors shall be painted as follows:

Three coat work,

First coat, exterior primer TT-P-25a
Second and third coats, oil paint
Class A or C as required by color TT-P-102

b. Wood Doors and Screen Doors shall be painted:

First coat, floor and deck enamel with one quart liquid (2/3 boiled linseed oil and 1/3 turpentine) added per gallon TT-E-487
Second and Third Coats TT-E-487

c. Exterior ferrous metal except cast iron shall be painted as follows:

First coat, red lead base paint	TT-P-86a
Second coat oil paint, colored	TT-P-102, Class B

d. Exterior galvanized sheet metal shall be painted as follows:

First coat, zinc dust-zinc oxide paint	TT-P-641b, Type II
Second coat, same as for ferrous metal	

7. INTERIOR PAINTING

a. Outside Entrance Wood Doors, wood trim, and other finish woodwork except as hereinafter specified shall be painted as follows:

First coat, except wood sash, primer sealer paint	TT-P-56a
Second coat, enamel undercoat	TT-E-543
Third coat, semi-gloss enamel	TT-E-508

b. Interior wood doors shall be painted as follows:

First and second coats, wood sealer, colored as approved, TT-S-176a, Class I, for soft wood and Class 2 for hard wood, wiped off before drying hard. Sand lightly with fine waterproof sand paper and water.

Third coat, water emulsion wax or paste wax rubbed to a gloss finish.

Commercial stain wax finishes, approved by the Local Authority, after submittal of samples, may be used for wood doors in place of the wood sealer and wax treatment.

c. Wood shelving, upper side, and inside of drawers of kitchen cabinet work, shall receive one coat of wood sealer, TT-S-176a.

d. Wood stair rails shall be painted with two coats of wood sealer, TT-S-176a colored as approved by the Local Authority, wiped off before drying, sanded with fine waterproof sandpaper and waxed.

e. Ferrous piping, and other ferrous metal shall be painted as follows:

*First coat,	primer sealer interior oil paint enamel undercoat	TT-P-56a or TT-P-51b or TT-P-543
Second coat,	interior oil paint semi-gloss enamel	TT-P-51b or TT-P-508 *

f. Zinc coated metal

First coat, zinc dust-zinc oxide paint	TT-P-641, Type I, Class B

Second and third coats to match the adjoining walls or ceilings.

g. Kitchen and bathroom walls and ceilings shall be painted as follows:

First coat, primer sealer paint	TT-P-56a
Second coat, enamel undercoat	TT-E-543
Third coat, semi-gloss enamel	TT-E-508

h. Cement Masonry Walls and plastered ceilings, not otherwise specified, shall receive two coats of latex base interior paint TT-P-29, for cement masonry walls the first coat to be ready mixed "Texture" Latex base paint, or latex base paint with "Texture" material added in accordance with the paint manufacturer's directions for painting cement masonry surfaces.

8. APPLICATION

Any required thinning of paint shall be done in compliance with the printed instructions of the manufacturer of the paint. A shop coat will be accepted in lieu of any priming coat required by these specifications.

Work shall be done by skilled mechanics and shall be uniform in appearance, of approved color, smooth and free from runs, sags, skips, and defective brushing. Make edges of paint adjoining other materials or colors sharp and clean without overlapping except that paint shall overlap glass slightly. Should workmanship of finish be found defective, proper preparatory work shall be done and additional coats applied as necessary to give a finish in accordance with specifications and color samples.

At completion, touch up and restore finish where damaged or defaced and leave in first class condition. Painted or finished surfaces damaged in fitting or erection shall be restored.

9. PAINTED SIGNS

Paint or stencil signs of sizes and details as indicated on the drawings. Lettering and numerals shall be neat and clear with sharp edges.

Use black enamel paint of hiding power sufficient to cover in one coat.

10. STRUCTURAL METAL

Structural steel and metal joists to be encased in concrete or covered with ceilings shall not be field painted. Structural steel to be encased in masonry shall have one field coat of iron oxide paint TT-P-31a in addition to the shop coat. Structural steel and miscellaneous or ornamental metal exposed to view shall be painted as specified herein for interior or exterior metal surfaces.

DIVISION 19

HARDWARE, BUILDERS

1. SCOPE

This Division includes builders' finish hardware and related items required to complete the work specified and indicated on the drawings except for the following items of work wherein the hardware has been included under their respective divisions.

Windows and screens, aluminum;
Metal toilet partitions;
Miscellaneous and ornamental metal;
Hardware for factory assembled wood or metal kitchen cabinets;
Hardware and fittings for mechanical equipment;
Hardware for folding metal closet doors.

a. Installation is provided in Divisions CARPENTRY AND MILLWORK and METAL BUCKS AND TRIM.

b. Items of Hardware not definitely specified herein and necessary for completion of the work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to adjacent hardware. Where size or shape of members is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified. Sizes shall be adequate for the service required.

2. MATERIALS

a. Hardware shall conform to the following Federal Specifications and the type numbers specified:

Locks and door trim	FF-H-106a	See Amendment No. 1
Shelf and miscellaneous	FF-H-111a	
Hinges	FF-H-116b	
Door closers	FF-H-121a	
Padlocks	FF-P-101b	

b. Finish for hardware, except as otherwise specified, shall be:

US 3 for hardware generally
US 26 for toilet and bathroom hardware
USP for hinges primed for painting
Finish for door closers shall be sprayed bronze or manufacturer's standard finish

c. Template hardware for metal bucks shall be factory applied or templates shall be furnished to the factory from which the work may be fitted to receive the hardware. Screws for use with metal shall be machine screws.

3. SAMPLES AND SCHEDULE

a. Samples of builders hardware proposed for use in the work shall be submitted to the Local Authority for approval before delivery of the hardware. Provide one sample each of every type specified or required. Hardware samples shall be properly identified as to type, number, and where it is proposed to be used. Hardware so identified may be installed in the buildings before completion provided the identification remains attached until acceptance of the buildings.

b. Schedule of hardware indicating type, number, location, and finish of each item required shall be submitted by contractor for approval with the samples. The hardware schedule shall assign serial numbers to items which will be used to identify the packages of hardware items. Approval of hardware schedule shall be for type, operation, and finish. The contractor shall be responsible for furnishing all necessary hardware items. After approval, supply six copies of the hardware schedule to the Local Authority for use and record.

4. KEYS AND KEYING

a. Locks shall be keyed differently unless otherwise specified. Cylinder locks of different changes shall be furnished with three keys each. Locks specified to be keyed alike in any system or set shall be furnished with one key for each lock, with a total of at least three keys for each set.

b. Die stamp each key with the number of lock change.

c. Padlocks for scuttle doors shall be keyed alike, not master keyed, and a total of 4 keys furnished.

d. Bit key locks shall be provided with two keys each.

e. Six master keys shall be furnished for cylinder locks on the project. No grand master key system shall be required. Master keys shall be delivered to the Local Authority by the contractor upon completion and occupancy or acceptance of any of the dwellings in the project.

f. Cylinder locks within dwelling units shall be keyed the same as entrance door to that unit or apartment, with three keys per unit or apartment. Cylinder locks in the non dwelling building shall be keyed alike except that locks of different changes shall be provided for the Executive Director's office.

g. Bath and Toilet Room door locks shall be provided with emergency release keys.

5. KEY CONTROL SYSTEM

Provide a visible key control system and cabinet as a complete unit for the indexing, storage, and control of all keys for locks throughout the project.

Wall type cabinets shall be furnished for 500 keys or less. Table type cabinets shall be furnished for 500 to 1200 keys.

a. Cabinets shall be made of not less than 20 gage cold rolled furniture steel with connections solidly welded and exposed welds ground smooth. Cabinets shall be so formed as to be rigid and self-supporting without observable deflection when fully loaded. Provide means of attachment for wall cabinets. Doors shall have continuous hinges with chrome plated handles and a locking device and three flat keys. Cabinet finish shall be gray or green baked enamel as selected by the Local Authority.

(1) Panels as required for the storage of keys shall be hinged in pin and socket bearings or hung on fast pin butts.

b. Control accessories for keys in number to correspond to the number of locks shall be provided as follows:

(1) One hook and one label pocket with key labels approximately 7/8 inch square marked consecutively with 5/16 inch high figures from 1 to the total number of locks.

(2) One red fiber non-detachable, permanent type key marker that can be easily attached to reserve pattern key. Non-detachable markers shall be die-stamped "FILE KEY MUST NOT BE LOANED", and marked with die stamp and enameled consecutive white 3/16 inch figures as for item (1).

(3) One white fiber detachable marker, to contain three duplicate keys, die-stamped with red consecutive numbering to correspond to item (2).

(4) One brass or plastic receipt holder with sufficient printed receipt forms to record and control all issued active keys.

(5) Cross index forms for listing keys alphabetically, numerically, and by lock serial number.

(6) Key and information collection envelopes approximately 5 x 3 inches, printed with blank space for location of lock, make, key change numbers and openings locked.

6. PACKING AND MARKING

Each lock set and item of hardware shall be packaged separately and shall be complete with necessary screws, key instructions, and required templates. Each individual container shall be marked with corresponding item number from the hardware schedule identifying the contents and defining its location in the finished work.

7. BUTTS (Hinges)

a. Butts for doors 1-3/4 inches thick shall be 4-1/2 x 4-1/2 inches; for doors 1-3/8 inches thick they shall be 3-1/2 x 3-1/2 inches and for doors 1-1/8 inches thick they shall be 3 x 3 inches. Exterior doors including screen doors shall have 1-1/2 pair of butts and interior doors shall have one pair of butts unless otherwise specified.

(1) Unless otherwise specified, door butts shall be of Type 2014-1/2P for painted doors and Type 2015-1/2 for stained or varnished doors.

(2) Butts for access doors to attic shall be 2029P, $2\frac{1}{2}$ x $2\frac{1}{2}$ inch, 2 required per door.

8. LOCKS

Cylinder locks supplied under this division shall be the product of one manufacturer and the same restriction shall apply to bit key locks and padlocks.

a. Hubs of cylinder knob locks for exterior doors shall be brass or bronze.

b. Cylinder rings of wrought bronze of proper size to fit door thickness shall be supplied.

c. Bit key mortise locks and mortise latches shall have lock cases, fronts and strikes of the same external measurements to suit a standardized mortise for all interior dwelling unit doors.

d. Letters in the following Lock Schedule refer to lock type scheduled herein according to function. Mortise or cylindrical locks and latches may be used. Lock sets shall be complete with escutcheons, knobs, roses and similar items as required and herein specified. Where two numbers are given under any one type of lock, both pieces shall be provided. In lieu of locks specified, locks of manufacturers' stock design, similar inquality and function, may be used, subject to the approval of the Local Authority.

Type	Mortise	Cylindrical
A	86B	161-B-4
B	3B	160L
D	86A	160A
E	3AA	160R
F	86B	161-B-4

Bathroom locks shall have an emergency access device and the locking mechanism shall release when the knob is turned or when the door is closed.

e. Lock Schedule

(1) Houses	Type
Front entrance doors;	A
Rear entrance doors;	F
Bathroom doors;	B
Inter-communicating and bedroom doors;	E
Service rooms, storage rooms, equipment rooms, tool rooms, workshops;	D
Administration rooms and offices.	D

f. Knobs and spindles shall be as herein specified. Variations from these requirements not involving increased cost may be required at the time samples are approved. Knobs for cylindrical locks shall be manufacturers' standard complying generally with requirements for other knobs.

(1) Knobs for mortise locks for exterior doors and doors from corridors to stairhalls in apartment and flat buildings shall be Type 202. Outside knobs shall be pinned to spindles. Other knobs shall be Type 203.

g. Roses for locks and latches shall be Type 335 or 336 except as otherwise necessary for the operation of the lock furnished.

(1) Cylindrical case lock and latch sets shall have roses that are standard for the manufacturer of the lock.

9. PADLOCKS

a. Padlocks shall be Type EPA, 2 inch size, and shall be provided for each scuttle door. Padlocks shall be keyed alike, not master keyed, and a total of four keys shall be furnished.

(1) Provide hasps, Type F-1405, 4-1/2 inches in size, or similar type safety hasp required to suit conditions for all padlocks, except where hasps are called for in other divisions of the specifications.

10. MISCELLANEOUS

Hardware attached to flush hollow core doors where blocking is not provided shall be attached to the door by through bolts with sleeve nuts.

a. Door closers shall be Type 3002 or Type 3005, sizes as specified, one each for the following openings:

(1) Exterior doors to the Management and Maintenance Building.

(2) All toilet room doors in the Management and Maintenance Building.

b. Door stops shall be provided for all exterior and interior doors where the swing of the door will permit the door closer or door knob to strike the wall surface. Door stops shall be Type F1323 or Type F1331. Suitable expansion shields shall be provided for securing to materials other than wood.

c. Door bolts shall be provided for inactive leaf of double doors; Type F1023A, 6 inches in length for top and Type F1023BC, 6 inches in length for bottom of doors.

d. DELETED

e. Six coat hooks, Type F1173 commercial finish, shall be provided for closets except linen closets.

(1) One robe hook, Type F1173 shall be provided in each bath room and toilet room.

f. Curtain bar, Type F1171 shall be provided for each closet having open front.

g. Hand rail brackets (for wood hand rails) similar to Type F1065A for other walls. Fastenings shall be as follows:

1 - 3/8 inch through bolt with cut washers for tile walls and solid partitions

Space brackets not over 6 feet apart and not more than 16 inches from ends.

h. Kitchen cabinets shall be provided with one pair of 2 inch wrought steel chromium plated semi-concealed cabinet hinges for each lipped door and one pair of 2 inch full surface butts, chromium plated, for each panel door. Friction catches for holding doors shut shall be Type F1073, one for each door. Pulls for doors and drawers shall be Type F1307, one for each door and one for each drawer 20 inches or less wide; two for each drawer over 20 inches wide.

i. Cabinets and counters of wood other than in kitchen. Doors shall have one pair of 2-1/2 inch butts 2018A. Locks for doors shall be brass or bronze wardrobe locks with two flat keys. Drawer locks shall be brass or bronze cabinet locks with two flat keys. Elbow catches Type F1075, drawer pulls 1310, one for drawers less than 20 inches wide, two for other drawers. Doors shall have pulls Type 1280, 1-1/8 inch diameter knob.

j. Screen doors shall have one pair of 3 x 3 butts, one chain door stop F1317, one No. 4 coil spring Type F1845, except galvanized, and one 3 inch rust proofed steel hook and eye and one door pull Type F1269.

k. Letter drop shall be provided for front door to the Maintenance and Management Building. Letter drop shall have an opening of not less than 1-1/2 x 7 inches with front and back plates of heavy gage wrought brass or bronze with over-all dimension of approximately 3 x 10 inches and square beveled design. Opening on outside plate shall be closed by a gravity hinged leaf providing weather protection. Door slot shall be installed not less than 30 inches from finished floor.

l. Mail boxes shall be provided one for each dwelling unit and to be located on the front porch wall adjacent to entrance doors, at height directed by the Local Authority.

(1) Mail boxes shall be individual type with provision for permanently mounting on the masonry wall and equal to Fulton No. B 88 Brush Brass finish, 26 gauge brass mail boxes manufactured by Patent Novelty Co., Fulton, Ill.

11. LETTERING AND NUMBERING

a. Provide numbers on wall near each front and each rear entrance door consisting of three inch high non-ferrous numbers of finish to match the hardware on wall near each front entrance house door.

(1) The numbers shall be in accordance with the schedule indicated on the site plans.

DIVISION 20

SHADES

1. SCOPE

This division includes window and door shades, venetian blinds, drapery rods and related items required to complete the work indicated on the drawings and specified.

a. Furnish and install shades for windows and glazed doors in dwelling units. Where multiple windows are shown, provide each unit with a separate shade.

b. Furnish and install brackets and drapery rods at all windows of dwelling units.

c. Furnish and install venetian blinds at all windows of non dwelling buildings scheduled or noted on plans to receive blinds.

2. MATERIALS

a. Shades _____ shall conform to Federal Specification DDD-S-251b,*of color as selected by the Local Authority from the manufacturer's standard colors.(* - Type IV)

(1) Width of cloth for window shades when mounted on face of trim shall be at least 2" more than the distance between the jambs; when mounted between jambs, not more than 1-1/2 inches narrower than distance between jambs. Width of cloth for door shades shall be at least 2" wider than the glass. Make shades 12" longer than height of opening for windows and glass in doors.

b. Drapery rods shall be hard steel, brass plated, round rods not less than 11/32 inch diameter and from one to three inches longer than the space between window jambs as required by the type of window trim, or jamb section.

(1) Brackets for drapery rods shall be the rod socket type with threaded sleeve to receive 11/32 inch drapery rods. Brackets shall be brass.

c. Furnish affidavit from the manufacturer, certifying that all shades installed at the project conform to these specifications.

d. Venetian Blinds shall be supplied with head box, tilt device, automatic stop, combination tape and pulley brackets, tape anchorage brackets, brackets to prevent blinds swaying, and shall operate by means of raising and tilting braided cords. Slats shall be of preformed spring tempered flexible aluminum alloy 2" wide with suspension between tapes not to exceed 30 inches, and shall have baked enamel finish of color selected from manufacturer's standard colors.

(1) Tape shall be Vinyl plastic with cross ladders, and shall show no after glow nor support combustion as tested by A.S.T.M. Specification D-626-41T. Tape shall be washable showing no change after boiling in water for a two hour period.

3. SAMPLES

Samples of materials proposed for use in the work as listed below shall be submitted to the Local Authority for approval:

Shades (complete)	-	2
Drapery Brackets	-	2
Drapery Rods	-	2 Feet
Venetian Blind	-	1

4. INSTALLATION

a. Shades shall be installed between window jambs on face of windows.

b. Shade brackets shall be securely fastened to window frames with suitable screws, the window manufacturer to machine the window frames to receive screws in accordance with templates to be furnished under this Division.

c. Shades shall be placed square and level, and in accordance with best trade practices.

d. Leave shades in perfect working order, free from defects.

e. Drapery rods shall be installed on the face of walls, centered on the openings, with suitable screws and expansion shields. Provide intermediate supports for lengths of over 4 feet.

f. Venetian blinds shall be installed to fit between jambs of windows in accordance with manufacturer's standard details. Shop drawings showing necessary provisions in the construction for the installation shall allow for removal and replacement of window screens without removing the blinds.

DIVISION 21

SITE IMPROVEMENTS (ROADS, WALKS, ETC.)

1. SCOPE

a. Work Included. This Division includes street, driveway and parking area pavements, other site surfacing, curbing, walks, steps, retaining walls, fences, clothes line supports, and all other surface improvements apart from buildings except as below stipulated.

b. Work Not Included. This Division does not include:

(1) Grading and related work, which are covered by the Division, EXCAVATION, FILLING AND GRADING.

(2) Work specified in the Division, LAWNS AND PLANTING.

(3) Utility installations, which are covered by other Divisions of these Specifications.

c. Limits of Work. The drawings show project site boundary lines for the purpose of identification; not all contract work is necessarily confined within those lines.

d. Coordination. The work specified in this Division shall be coordinated carefully with Lawns and Planting and with overhead and underground utility work covered by other Divisions.

2. SUBGRADE FOR SITE IMPROVEMENTS

a. Grading. Do any necessary grading in addition to that performed in accordance with the Division, EXCAVATING, FILLING AND GRADING, to bring subgrades, after final compaction, to the required grades and sections for site improvements.

b. Preparation of Subgrade. Loosen exceptionally hard spots and recompact. Remove spongy and otherwise unsuitable material and replace with stable material. Fill and tamp traces of utility trenches.

c. Compaction of Subgrade. Compact the subgrade of all surfaced areas with appropriate compacting equipment by other means to such degree as will insure against settlement of the superimposed work.

d. Checking Subgrade. Maintain all subgrades in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. Immediately

in advance of concreting, check subgrade levels with templates riding the forms, correct irregularities, and compact thoroughly any added fill material. Correct irregularities, compacting thoroughly any fill material.

e. Utility structures. Check for correct elevation and position all manhole covers, valve boxes, and similar structures located within areas to be paved or surfaced, and make, or have made, any necessary adjustments in such structures.

3. CONCRETE MATERIALS

a. Portland cement shall conform to A.S.T.M. Specification C 150-53, Type I or Type III.

b. Aggregates for concrete shall conform to A.S.T.M. Specification C 33-54T.

(1) Fine aggregates shall be natural sand, or subject to the approval of the Local Authority, sand prepared from stone, gravel, or other inert materials having similar characteristics.

(2) Coarse aggregates shall be crushed rock or gravel or, subject to the approval of the Local Authority, a combination of these materials. Maximum size of pieces shall be 1 1/2 inch, except in concrete roadway pavement in which it shall be 2-inch.

c. Water shall be clear, and free from injurious amounts of oils, acids, alkalis, organic materials, or other deleterious substances.

d. Steel reinforcing bars shall be deformed bars conforming to one of the following A.S.T.M. Specifications: A 15-54T, A 16-54T, or A 160-54T. Deformation shall conform to A.S.T.M. Specification A 305-53T. Reinforcement shall be free from scale, rust, or coating which will reduce the bond to the concrete.

e. Welded steel wire fabric for concrete reinforcement shall conform to A.S.T.M. Specification A 185-37.

f. Premolded joint filler shall be of non-extruding type meeting A.S.T.M. Specification D 544-52T except that premolded joint filler used in concrete walk construction may be of either non-extruding or resilient type.

g. Poured joint filler shall conform to A.A.S.H.O. Specification M-18, Type A, or to Federal Specification SS-F-336a,

h. Storage of Concrete Materials

(1) Cement. Provide suitable means for storing and protecting the cement against dampness. Bags of cement which have become partially set or which contain lumps of caked cement shall be rejected.

(2) Aggregates shall be so stockpiled as to prevent segregation of component sizes and intrusion of foreign matter. Aggregates of different gradings shall be stored separately.

4. PROPORTIONING AND MIXING CONCRETE

a. Concrete for site improvements shall be a mix of proportioned fine and coarse aggregates with portland cement. Minimum cement content shall be six bags per cubic yard of concrete and maximum water contest shall be six U.S. gallons per sack of cement, including moisture in aggregates.

b. Proportioning Aggregates. The ratio of fine to total aggregate shall be such as will produce a dense, homogenous, and workable mixture, which can be placed without segregation of materials and which will attain at 28 days a minimum compressive strength of 3000 pounds per square inch as established by laboratory test.

c. Measurement of Materials. Measure concrete materials by such weighing methods as will permit accurate control of proportions and easy check thereof at all times.

d. Mixing Concrete. Mix all concrete in an approved power batch mixer, except as otherwise specifically authorized by the Local Authority. Mix for a period of not less than 1 1/4 minutes after all materials are in the drum.

e. Ready-Mixed Concrete. Certificates shall be furnished from the mixing plant that concrete has a 28-day compressive strength of at least 3000 lbs. per square inch, when tested in accordance with methods described in A.S.T.M. Standard C39-49. No change shall be made in materials or the established mix without prior approval of the Local Authority. Ready mixed concrete shall be transported to the site in transit-mix or agitator trucks having watertight drums loaded not in excess of rated capacities. The concrete shall be delivered and discharged within one hour after the cement is in the mixer. Concrete which, when delivered, is not plastic and workable will be rejected.

f. Ready Dry-Batched Mixes. Certificates shall be furnished for concrete strength and prior testing similar to those above specified for ready-mixed concrete. Ready dry-batched mixes shall be transported to the site in trucks having batch compartments of adequate size for the rated capacity of the mixer. Protect cement with tarpaulin while in transit. Add water to batch after discharge into the mixer, which must be within two hours after the cement was added to the batch.

g. Retempering of concrete that has partially hardened, that is, remixing with or without additional cement, aggregate or water, will not be permitted.

5. PLACING CONCRETE

a. Subgrade. Place concrete only on a moist compacted subgrade or base, free from loose material. Place no concrete on a muddy or frozen subgrade.

b. Forms. All forms shall be free from warp, tight enough to prevent leakage of mortar, and substantial enough to maintain their shape and position, without springing or settlement, when concrete is placed or vibrated. Forms shall be staked, braced and/or tied together securely. Forms shall be clean and those for surfaces to be exposed shall produce a smooth, even finish without fins or board marks.

(1) Set forms for slabs on ground at exact finished grade; check for line and grade and correct as necessary immediately before concreting. Provide uniform bearing for such forms. Use flexible or curved forms when edge of slab is to be curved to a radius of 100 feet or less.

c. Reinforcing bars shall be accurately placed, and securely supported and fastened to prevent movement during placement of concrete. Wire fabric shall have a minimum side and end lap of 6 inches.

d. Concrete shall be deposited so as to require as little rehandling as practicable. Placing shall be continuous between transverse joints or in individual sections of the work. Spade concrete thoroughly along forms and expansion joints, and work carefully into corners and around reinforcement. Tamp and screed to a dense mass. Mix and place no concrete when the air temperature is below freezing. If the temperature may be expected to fall below 40 degrees Fahrenheit within 24 hours after the concrete is placed, heat water and aggregates to bring the temperature of concrete mix to at least 50 degrees Fahrenheit.

6. CURING CONCRETE

a. Covering. Except as otherwise specified, cure all concrete by covering surface with burlap or cotton mats, straw, sand or other approved material, and keeping such covering wet for at least 3 days after concrete is placed (36 hours when high early strength cement is used).

(1) Impervious Membrane. At the Contractor's option, concrete may be cured through the application of a transparent, impervious membrane of a type approved by the Local Authority. The liquid shall contain a fugitive dye and shall be of such composition as not to react with the concrete nor alter appreciably its natural color. Apply the liquid immediately after free water has disappeared from the finished surface of the concrete; apply the form of a fine mist and in such manner as to cover the surface with a uniform, flexible film, ample to seal the surface thoroughly, and without marring the concrete finish. Keep workmen, equipment, and materials off the membrane for 3 days after applying.

b. Cold Weather Protection. Whenever the air temperature may be expected to reach the freezing point, spread straw or other blanketing material to sufficient depth to keep concrete from freezing, or provide enclosure and heating device capable of maintaining concrete temperature of at least 50 degrees Fahrenheit. Maintain such protection for at least 5 days. The Contractor shall be responsible for removing and replacing any concrete injured by frost action.

7. CONCRETE WALKS

a. Scope. All concrete walks shall be constructed in accordance with this specification.

b. Slopes. Provide grade stakes not more than 25 feet apart for all walk construction. Check tops of forms for grade before placing concrete. Introduce short vertical curves in walks as shown on the drawings or at points where change in walk grade exceeds 2.00%. For a distance of 2 feet from top and bottom of steps walks slopes shall not exceed 1/2 inch per foot. Provide 1/4 inch per foot crown or cross slope in the direction indicated on the drawings. Pitch walks to adjacent storm sewer inlets and make slight adjustments in slopes at walk intersections as necessary or directed to provide proper drainage.

c. Dimensions. Concrete walks shall be of one-course construction, 4 inches thick, and of widths shown on the drawings.

d. Finish. Tamp and screed the concrete true to grade and section, bringing sufficient mortar to the surface for finishing, and give a wood-or carpet-float finish, provided that where the walk grade exceeds 6%, the surface shall be given a belted or broomed finish as directed by the Local Authority. Round all edges, including those along expansion joints and grooves, to a 1/4 inch radius. Where walks terminate at curbs, finish the walk 1/4 inch above the curb, providing a neat bevel.

e. Expansion Joints. Provide 1/2-inch transverse expansion joints, with premolded filler, not more than 50 feet apart, also at walk junctions and intersections, at top and bottom of steps, and where walks abut curb returns, buildings, platforms or other fixed structures, or terminate at curbs. Such expansion joints are not required (except at curb returns) between walks and contiguous parallel curbs. At walk junctions and intersections, the required expansion joints shall be located at the end of each rounding or fillet. Expansion joints shall be at right angles to the slab and extend the full depth thereof; the premolded filler shall extend to within 1/4 inch of the walk surface. Locate expansion joints in walks as nearly as practicable opposite those in abutting curbs.

f. Grooves. Between expansion joints, cut grooves 1/8 to 1/4 inch wide and at least one inch deep, as follows:

(1) In walks not wider than 6 feet, transverse grooves with a spacing approximately equal to the walk width, but not less than 4 feet.

(2) In walks wider than 6 feet, transverse grooves with spacing approximately equal to half the walk width, and a longitudinal groove on the center line of the walk.

g. Protection. Remove no forms for 24 hours after pouring concrete. Protect concrete walks from pedestrian traffic for a period of 3 days after pouring.

8. CONCRETE STEPS

a. Scope. These specifications apply only to steps which are not attached to a building.

b. Subgrade. Compact subgrade thoroughly unless otherwise approved by tamping, and trim to required shape. Extend footings to undisturbed subsoil; if deeper than required by drawings, the Contract Price will be adjusted (see GENERAL CONDITIONS).

c. Forms. Build forms so as to permit their removal from exposed surfaces without damage to the green concrete.

d. Finish. Unless otherwise shown, round edges to a 1/2 inch-radius. Finish treads with a wood float. Remove face forms as soon as practicable, fill any surface voids with 1:2 mortar, and rub down exposed surfaces; plastering is not permitted.

e. Protection. Do not open steps for use for 7 days, or set handrail for 14 days, after concrete is placed.

f. Handrail shall be provided on the right side, leading down, of all flights of steps having 5 or more risers. Handrails shall be 1-1/2 inch I.D. standard steel pipe. Connections may be welded and ground smooth or made with malleable iron fittings with either screwed or slip and pinned joints. Pipe threads shall not show in the finished rails. Fittings must be cast to the correct angle to fit the work. Set posts in built-in sleeves, not less than 2-1/2 inch I. D. galvanized steel pipe, left 1/4 inch below the surface of the concrete. Clean sleeves to receive posts and after careful aligning grout posts in place with 1:2 cement mortar. Paint handrail as specified in the Division, PAINTING.

9. CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER

a. At the project street and parking areas, as shown on drawings construct concrete curb and gutter to be in accordance with the specifications which follow.

b. Contraction Joints. Construct concrete curb, gutter and/or combined curb and gutter in sections 6 to 10 feet long by use of 1/8 inch steel division plates. Such plates shall be of size and shape conforming to cross section of the concrete and shall not be bent or otherwise deformed.

c. Expansion Joints. Provide expansion joints, with premolded filler cut to shape of cross section, as follows: (1) at ends of all returns, (2) to match expansion joints in concrete pavement, and (3) at not more than 50-foot intervals when adjoining pavement is other than concrete. Expansion joints shall be at least 1/2 inch wide and, if adjoining pavement is concrete, of the same width as the expansion joints in the pavement.

d. Finish. Tamp and screed concrete as soon as placed. Remove division plates and face forms as soon as practicable; fill any honeycombed placed with 1:2 mortar and give exposed surfaces a smooth, wood-float finish, without plastering. Finish square corners to 1/4 inch radius and other corners to

radii shown. Before final finish of gutters, test with 10-foot straight edge and correct any depressions which will not drain.

e. Protection. Remove no forms (except face forms) for 24 hours after placing concrete. Barricade against pedestrians for 3 days and against vehicular traffic for 14 days. Compact thoroughly the backfill behind the curb.

10. PORTLAND CEMENT CONCRETE PAVEMENT FOR ROADWAYS AND PARKING AREAS

a. General. Requirements hereinbefore for subgrade, concrete materials, and concreting are applicable to the hereinafter specified installation of Concrete Pavement.

b. Joints (General). Transverse joints shall be at right angles to the center line and extend to full width of the pavement. Longitudinal joints shall be on or parallel to the center line of the pavement. All joints shall be true to line and perpendicular to the finished grade. Except as otherwise shown on the drawings, joint locations shall be as hereinafter specified. After the concrete has set, sweep clean all joint grooves and fill with poured filler about 1/4 inch below finish surface.

c. Expansion Joints

(1) Locations of transverse expansion joints shall be as follows: at intervals not exceeding 300 feet in roadway tangents, at points of curve and tangent of all curves including curb returns, and in parking areas as shown on the drawings and where pavement abuts a fixed structure.

(2) Premolded filler in expansion joints shall be 1/2 inch thick and extend from bottom of slab to 3/4 inch below the pavement surface. Punch filler to the exact diameter and location of dowels. Hold filler firmly in place by an approved bulkhead and cover edge of filler to prevent damage during concreting. Deposit and strike off concrete on both sides of the bulkhead before removing it.

(3) Dowels across expansion joints shall be 3/4 inch smooth, round bars, 15 inches long, spaced 12 inches on centers. Dowels shall be at the approximate neutral axis of the slab, exactly parallel to the surface and to the longitudinal axis of the pavement, and held firmly in position by metal devices left in the concrete. One end of each dowel shall be coated with heavy grease and provided with approved tight-fitting metal sleeves.

(4) Around utility structures, such as manhole castings and valve box tops, provide expansion space 1/2 inch in width, filled with either premolded or poured filler.

d. Transverse Contraction Joints. Such joints shall be located at approximately unfform intervals of not more than 20 feet between expansion joints. They shall be of the dummy-groove type, consisting of slots not less than 1/4 inch wide and having a depth equal to 1/4 to 1/3 the thickness of the slab. Such joints shall receive poured filler as hereinbefore specified.

e. Transverse Construction Joints. Provide a construction joint when the placing of concrete is suspended for more than 30 minutes. Excepting emergency stops, locate such joints at the required position of expansion or contraction joints. If at an expansion joint location, construct the above specified expansion joint. If at a contraction joint location or if at an emergency stop, form the construction joint by depositing concrete against a bulkhead cut to the cross section of the slab and provide dowels as hereinbefore specified for expansion joints. However, if an emergency stop is made within 8 feet of the last expansion or construction joint location, remove concrete back to that joint.

f. Longitudinal Joints. Longitudinal construction joints shall be of the meta-strip type. The strip shall be not lighter than No. 16 gage and shall extend from bottom of the slab to 1/2 inch below the pavement surface. Longitudinal joints which are not constructed joints shall be of the metal-strip type just described or of the dummy-groove type above specified for transverse contraction joints. Provide deformed tie bars, 1/2 inch in diameter, 30 inches long, 30 inches on centers, across all longitudinal joints (except longitudinal expansion joints, if any, in parking area pavements). Such tie bars shall be located approximately midway between top and bottom of the slab, and shall be held in place by metal chairs left in the concrete.

g. Finishing (Hand Method). Provide bridges as necessary for carrying out the operations here specified.

(1) Strike off the concrete, as it is placed, with a heavy screed conforming to the pavement cross section.

(2) Spade concrete thoroughly or mechanically vibrate concrete along edges and joints and consolidate with transverse tamping screed.

(3) Consolidate further with longitudinal float.

(4) Test surface longitudinally with 10-foot straight edge and transversely with screed; correct all observable departures from grade or section in excess of 1/8 inch.

(5) Give belt finish to surface.

(6) Broom surface transversely with coarse brush to provide uniform non-skid finish.

(7) Round edges of concrete at all joints to 1/4 inch radius.

(8) Fill honeycombed areas in sides of slab with 1:2 mortar as soon as side forms are removed.

h. Integral Curb. Place concrete in integral curb to precede the initial set of concrete in the slab, removing free water, laitance or dust from slab area to be covered. Puddle concrete in curb sufficiently to obtain bond but not to cause bulging of slab. Check curb and gutter with straight edge and correct if necessary.

i. Curing. Except as otherwise provided for in use of impervious membrane, cover the pavement surface with heavy burlap or with cotton or jute felt mats as soon as concrete has set sufficiently not to be marred, and keep such covering wetted for not less than 12 hours. Thereafter cure the concrete for a period of at least 5 days by one of the following methods:

(1) By cotton or jute felt mats kept thoroughly wetted.

(2) By straw covering (6 pounds dry per square yard) kept saturated with water.

(3) By earth or sand covering, at least 2 inches deep, kept thoroughly wetted.

(4) By waterproofed paper, weighted to maintain contact with the concrete, strips to be lapped at least 18 inches.

(5) By impervious membrane, applied as hereinbefore specified. This material may be applied immediately after the concrete surface is finished, in which case the above specified wetted-burlap or mat covering is not required, or it may be applied immediately after the burlap or mat covering is removed.

Materials used for curing the concrete shall meet the approval of the Local Authority. Covering material (except membrane) shall extend 18 inches beyond the edges of the pavement. When the concrete has cured, remove and dispose of the covering material.

j. Barricades; Opening to Traffic. Provide barricades and crossings as necessary to keep pedestrians off the pavement during the curing period. Do not permit vehicular traffic on the pavement within 14 days after the concrete is placed and until joints are filled (as hereinbefore specified).

11. SPLASH BLOCKS

Cast splash blocks in smooth, well oiled forms. Remove from forms as soon as blocks can be handled without damage and moist-cure under mats for 3 days. Bed splash blocks firmly after topsoil has been placed.

12. RETAINING WALLS

a. Reinforced Concrete Walls. Soil foundation shall be approved by the Local Authority before concrete is placed or form erection started. Concrete work shall be as hereinbefore specified, and expansion joints and other details as shown on the drawings. Place weep-holes as shown at the lowest points where free outlet can be obtained and space them not more than 10 feet on centers. Give vertical edges of walls at expansion joints and elsewhere a 1/2 inch radius by using coves in forms. Tool top edge of walls to the same radius. Immediately following the removal of forms, all fins and irregular projections shall be removed from all surfaces except from those which are not to be exposed or are not to be waterproofed. On all surfaces, clip back the ends of form ties and the cavities produced by form ties and all other holes, honeycomb spots, broken corners or edges and other defects shall be thoroughly cleaned, and after having been kept saturated with water for a period of not less than three hours shall be carefully pointed and trued with a mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete being finished. Mortar used in pointing shall be not more than one hour old. The mortar patches shall be cured as specified under Curing. All construction and expansion joints in the completed work shall be left carefully tooled and free of all mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

The resulting surfaces shall be true and uniform and free of rust spots. All surfaces which cannot be repaired to the satisfaction of the engineer shall be "rubbed". Place backfill in layers not exceeding 6 inches loose thickness and thoroughly compact each layer. Above weep-hole level and for a width of one foot behind walls use only approved porous material for backfill. Perform backfilling not less than 21 days after concrete is placed.

(1) Provide sleeves for pipe hand rail and for protective fence where shown or scheduled on the drawings. Pipe rail shall be similar indesign and materials to hand rail specified under Division 11, MISCELLANEOUS AND ORNAMENTAL METAL, and protective fence, where scheduled, shall be as specified under this Division.

13. CLOTHES LINE SUPPORTS AND LINES

a. Materials

(1) Posts shall be 2½ inch I.D. standard steel pipe weighing 5.79 pounds per foot, or approved 2¼ inch H or I section weighing at least 5.7 pounds per foot, provided with fittings and line attachments as shown on the drawings. Posts shall be long enough to give a clothes line height, above finished grade, of 6'-2" at the post, and to extend 3'-0" below finished grade. After fabrication, the supports shall be hot-dip galvanized, with a zinc coating of at least 2 oz. per sq. ft.

(2) Clothes Lines shall be galvanized steel wire, U. S. Standard #10.

b. Erection. Set posts in concrete footings 12 inches in diameter and 3'-6" deep below finished grade. Line, level, and plumb posts accurately. Trowel each footing to a smooth bevelled finish 2 inches above finished grade.

14. CHAIN LINK FENCE

a. Materials

(1) Chain link fabric shall conform to Federal Specification RR-F-191a for Type A, 2-inch mesh fabric, with top and bottom edges knuckled, provided that fabric 4 feet or less in width shall be of No. 11 wire, 0.120 inch in diameter, and fabric over 4 feet in width shall be of No. 9 wire, 0.148 inch in diameter. The fence height shown or specified means the nominal width of the fabric.

(2) Posts, top rails, braces and gate frames shall be standard O.D. steel pipe of the following nominal diameters and weights, or H, I or U rolled sections, approved by the Local Authority, of approximately equal weight and structural strength:

	FENCE HEIGHT			
	4 feet		6 feet	
	Diameter	Wt per ft.	Diameter	Wt per ft
Line Posts	2"	2.71 lbs.	2-1/2"	3.65 lbs
End, corner & gate posts	2-1/2"	3.65 lbs.	3"	5.79 lbs
Top rails	1-3/8"	1.68 lbs.	1-5/8"	2.27 lbs.
Braces	-	-	1-5/8"	2.27 lbs.
Gate frames	1-3/8"	1.68 lbs.	1-5/8 "	2.27 lbs.

Posts at points where fence changes alignment in amount of twelve degrees or more will be classified as corner posts and shall be of size and weight specified for end, corner and gate posts.

45 degree extension arms supporting 3 strands of No. 12 barbed wire shall be provided for fence shown at quarry perimeter and at service area adjacent to the Management and Maintenance Building.

Steel in all such pipe shall be copper-bearing and in rolled sections shall be high carbon. Provide approved post tops, sleeves and other fittings for complete installation. All such framework material shall be hot-dip zinc-coated after fabrication, coating to weigh not less than 2.0 oz. per sq. ft.

(3) Gates. Access entrance indicated at service area of the Management and Maintenance Building shall have double swing gates for a 10 foot wide opening, to have 2" O.D. standard pipe frame with 1-5/8" O.D. pipe internal bracing and welded at all joints to provide weathertight construction. Frames shall be filled with same fabric as specified for the link fence and with vertical extension arms supporting three strands of barb wire. Include double gate latch of drop bar type to engage a heavy mealleable iron gate stop anchored in a concrete footing, gate keepers which automatically engage when the frame is swung open, and with provision for padlocking gate in closed position. Include malleable iron offset hinges allowing gate to swing back parallel with the link fence and any miscellaneous fittings required to complete the installation.

b. Erection:

(1) Post spacing in each run of fence shall be uniform and not over 10 feet on centers. Posts shall be carefully aligned and plumb in each direction.

(2) Post settings in earth shall consist of concrete footings not less than 12 inches in diameter and 3'-0" deep below finished grade, except that for line posts in fences 4 feet or less in height, the footing diameter shall be 10 inches and the depth 2'-6". Set posts 6 inches above bottom of concrete footing. Bevel top of footing to 2 inches above finished grade at post and trowel smooth.

(3) Posts in concrete shall be set in pipe sleeves and in solid rock shall be set in holes and grouted or leaded solidly in place. Such holes or sleeves shall be of a diameter at least 2 inches larger than the greatest sectional dimension of the post, and shall be at least 12 inches deep for a fence height of 4 feet or less and 18 inches deep for a fence height of 5 or 6 feet.

(4) The top rail shall be continuous through line posts and rigidly connected to all end, corner and gate posts.

(5) Truss bracing shall be provided in panels adjoining all end, corner and gate posts, for fence heights exceeding 4 feet.

(6) Chain link fabric shall be placed with top flush with top of rail and bottom 2 inches above finished grade. Stretch fabric tightly to eliminate sags and buckles. Lace to posts at intervals not exceeding 14 inches and to top rail at 24-inch intervals, with No. 6 galvanized wire or equivalent. Turn back lacing to eliminate exposed ends.

c. Shop drawings shall be furnished. (See GENERAL CONDITIONS)

15. GARBAGE RECEIVERS

One under ground garbage receiver unit shall be installed for each Dwelling Unit, located adjacent to the Kitchen entrance platform as shown on the plans, and with surrounding concrete paved surface raised 1" at the receiver periphery, and sloping away from the receivers in all directions 2" per foot horizontal measure.

a. Materials.

The receiver unit shall consist of:

(1) An outer shell made of 16 gauge copper alloy steel strengthened by corrugations at top and bottom and heavily painted with asphaltic cement, or other rust resisting meterial and construction carrying out the manufacturer's guarantee for a 10 year period.

The bottom shall be open to allow drainage and stiffened by galvanizing cross rods on which the pail shall rest.

(2) A two piece top shall be hinged to the outer shell, and arranged with an inner service lid made to fit closely and hinged to the outer ring, arranged to open separately from the outer ring. The top, equally durable, shall be of 1/8" formed steel (galvanized or other approved equally durable construction, standard with the manufacturer).

(3) Containers or pails shall be 15 gallon capacity made of 24 ga. or heavier copper-alloy steel galvanized after fabrication with heavy wire lifting bail; double locked seams, and heavy wire rims.

b. Installation. Excavate to a depth of 8" greater than the receiver depth, and backfill to the level of the bottom of the receiver with coarse gravel. Backfill around receivers to subgrade of the adjoining concrete slab. Place a 4" x ½" master expansion joint collar around the outer shell and pour the concrete against the collar, or form ½" away from the shell, remove form, and fill between the shell and concrete with joint filler as specified for walks and paving.

16. RIP RAP

This item consists of a covering of stone laid on the slopes as shown on the plans, and in conformity with lines and grades as shown on plans.

a. Material. Stone for Rip Rap. Rip Rap shall consist of field stone, or rough cut quarry stone. This stone shall be hard, firm, with a Los Angeles abrasion test of not more than 60. It shall be at least one (1) foot thick at all points, if field stone or rough quarry stone is used, and shall average ten (10) inches thick if rough cut stone is used. The surface of the field or rough quarry stone shall not vary more than three (3) inches above and the same amount below the theoretical surface. When rough cut stone is used the surface shall not vary more than one and one half (1½) inches above and the same amount below the theoretical surface.

b. Preparation of Foundation. The slope upon which the rip rap is to be placed shall not be steeper than one and one half ($1\frac{1}{2}$) to one (1). Immediately prior to the placing of the rip rap, the slopes on ground surface shall be trimmed to the lines and grades indicated on the plans, or as directed by the engineer. When this trimming necessitates filling depressions, the loose earth placed in depressions shall be thoroughly compacted by tamping.

c. Construction Method. All rip rap shall be started in a trench two (2) feet lower than the surface of the natural ground, measured vertically. The side of the trench next to the fill shall form a continuation of the fill slope. The outer edges, ends, and top of the rip rap shall be formed in the last five (5) feet of construction so that the surface of the rip rap, where the construction terminates, will be embedded and flush with the surface of the slope or ground adjoining the rip rap. The rip rap stone shall be placed by hand, laid with close broken joints, roughly perpendicular to the slope, and resting on the proposed slope. The larger stone shall be placed in the lower course. Where field or rough unhewn stone is used, the larger interstices shall be clinked with smaller pieces of stone, so that the entire construction shall present a compact mass.

17. CLEANUP

All trash and surplus materials of every character resulting from the work of this division shall be removed from the site. Any concrete, bituminous substances or other materials spilled on pavement, walks or structures shall be completely removed.

DIVISION 22

UTILITIES (SEWERS)

1. SCOPE

This Division includes all sanitary and storm sewers, appurtenances, and related items, including excavating and backfilling, required to complete the work indicated on the drawings, except house sewers from buildings to points 5 feet outside of building walls, which items are specified in the Division, PLUMBING.

a. Connections to Building Piping. The ends of sanitary sewers shall be tightly plugged or capped 5 feet outside of building walls, pending the connection thereto of the building piping as specified in the Division, PLUMBING.

b. Connections to Drain Leaders. The ends of terra cotta rain water lines where shown on plans shall turn up at the building line and leader locations, extending not less than six inches above grade and caulked solid around the leader end by this contractor with compound as specified.

c. Provide all materials and appurtenances necessary for the complete installation of each utility, whether or not all such materials and appurtenances are shown on the drawings or described in the specifications.

2. PERMITS AND CODES

The intent of this Division of the specifications is that the contractor's bid on the work covered herein shall be based upon the drawings and specifications, but that the work shall comply with all applicable codes and regulations as amended by any waivers. The Contractor's attention is directed to the Section, "Permits and Codes", of the GENERAL CONDITIONS.

3. LOCAL STANDARDS

The term "local standards" as used herein, means the standards of design and construction of the respective municipal department.

4. EXISTING IMPROVEMENTS

Maintain in operation condition all active utilities, sewers, gutters and other drains encountered in the utility installation. Repair to the satisfaction of the owner any surface or subsurface improvement damaged during the course of the work, unless such improvement is shown to be abandoned or removed. (See also "Care of the Work" in the GENERAL CONDITIONS.)

5. TRENCHING AND BACKFILLING

a. General. Unless otherwise shown, each utility shall be laid in separate trenches, sewer, (water, Division 22a) and (gas lines by others), with not less than 3 feet of undisturbed earth between sewer, water and gas trenches. Lay all piping in open trench except when the Local Authority gives written permission for tunneling. Maintain ready access to fire hydrants by fire-fighting apparatus.

b. Width of Trench. Excavate trenches of sufficient width for proper installation of the work. When the depth of backfill over sewer pipe exceeds 10 feet, keep the trench below the level of the top of the pipe as narrow as practicable.

c. Sheeting, Bracing, Water Removal. Sheet and brace trenches, and remove water, as necessary to fully protect workmen and adjacent structures and permit proper installation of the work. Comply with local regulations or, in the absence thereof, with the provisions of the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Inc. Under no circumstances lay pipe or install appurtenances in water; keep the trench free from water until pipe joint material has hardened. The presence of ground water in the soil or the necessity of sheeting or bracing trenches shall not constitute a condition for which any increase may be made in the Contract Price, except that when sheeting is left in place, on the written order of the Local Authority, the Contract Price shall be adjusted (see GENERAL CONDITIONS). Sheeting left in place shall be cut off not less than 2 feet below finished grade. Sheeting shall not be removed until the trench is substantially backfilled.

d. Rock Excavation. Refer to Division 2, Section 2, Sub Surface Data, and Section 7, para. c, Rock Excavation. All material to be excavated shall be unclassified and no adjustment in Contract Price will be made on account of the presence or absence of rock, shale, masonry, or other materials. In the case of any change ordered in writing by the Local Authority, in the quantity of excavation, its value shall be determined in accordance with the Unit Prices established in the contract; and the Contract Price will be adjusted as provided in the General Conditions.

e. Blasting. Obtain written consent and approval of method from the Local Authority before proceeding with blasting. Handle and employ explosives as stipulated in the Division, EXCAVATING, FILLING AND GRADING. Cover blasts with heavy timbers or mats. Set off no blast within 25 feet of pipe already laid in the trench. Protect by earth backfill pipe already laid.

f. Grading Trench Bottom. Grade the bottom of trenches evenly to insure uniform bearing for the full length of all pipes. Cut holes as necessary for joints and joint-making. Excavate all rock, cemented gravel, old masonry, or other hard material to at least 4 inches below the pipe at all points. Refill such space and all other cuts below grade with sand or fine gravel firmly compacted.

g. Special Supports. Should latent soil conditions, other than hard material as referred to above, necessitate special supports for piping and/or appurtenances, including the removal of unsuitable material and refilling with gravel or other material, the Contract Price will be adjusted (see GENERAL CONDITIONS). Perform any such work as directed by the Local Authority.

h. Tree Protection. Exercise care to protect the roots of trees to remain. Within the branch spread of such trees perform all trenching by hand. Open the trench only when the utility can be installed immediately, prune injured roots cleanly; backfill as soon as possible. Perform all this work under direction of the Local Authority.

i. Backfilling. Backfill trenches only after piping has been inspected, and locations of pipe and appurtenances have been recorded. Backfill by hand around pipe and for a depth of one foot above the pipe; use earth without rock fragments or large stones and tamp firmly in layers not exceeding 6 inches in thickness, taking care not to disturb the pipe or injure the pipe coating. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper, or if the soil is granular by flooding, provided that under pavements, walks and other surfacing the backfill shall be tamped solidly in layers not thicker than 6 inches. Exclude all cinders and rubbish from trenches in which metal pipes are laid.

6. SEWER MATERIALS

a. Sewer Pipe. Except as otherwise shown, pipe for sanitary sewers shall be standard strength clay sewer pipe; pipe for storm sewers shall be standard strength clay pipe or standard strength concrete pipe, except that underground lines

shown connected to rain leader and downspouts shall be standard strength clay sewer pipe.

Pipe 15" and larger shall be standard strength, reinforced.

Concrete sewer pipe	A.S.T.M. C 14 - 41
Reinforced concrete sewer pipe	A.S.T.M. C 75 - 41

b. Fittings. Provide proper fittings for the installation and connection of all lines. In general, provide a Y branch and a 1/8 curve for each branch connection except at manholes. Connections made by cutting holes in pipes will not be permitted.

c. Sewer Pipe Joint Material. Joints in sanitary and combined sewers shall be made with bituminous compound. Joints in storm sewers shall be made with bituminous compound or cement sand-mortar, except that ends of rain leaders shall be caulked into clay pipe hubs with bituminous compound.

(1) Bituminous compound shall be GK or equal or Army Specification 83-26, or the hot-poured type and meet the approval of the Local Authority. The material shall adhere tightly to the pipe surfaces and permit slight movement of the pipe without injury to the joint. It shall show no deterioration when immersed for 5 days in a one per cent solution of hydrochloric acid or a 5 per cent solution of caustic potash. Submit sample of the material (see "Samples, Certificates, and Tests" in the GENERAL CONDITIONS).

(2) Mortar for storm sewer pipe joints shall be 1:2 Portland cement-sand mixture, with a minimum of water.

(3) Gasket material shall be dry, twisted jute packing complying with Federal Specification HH-P-117, Type I, or approved substitute meeting the approval of the Local Authority. If other than jute, submit sample and make such test joints with proposed material as the Local Authority may require.

d. Brick for manholes and other sewer structures shall conform to applicable requirements of A.S.T.M. Specifications C 62-49, Grade SW. Clean, used paving or building brick which meet that specification, or radial brick meeting the requirements herein given, may be used for sewer structures.

e. Concrete for sewer structures shall be a 1:2:4 mix meeting the applicable requirements therefor given in the Division "SITE IMPROVEMENT - ROADS, WALKS, ETC.".

f. Mortar for masonry in sewer structures shall be a 1:3 cement-sand mix, provided that hydrated lime may be substituted for not to exceed 10 per cent, by weight, of the cement.

g. Castings for all manholes and castings for catch basins and other sewer structures in city streets or streets to be dedicated shall comply with local standards. Castings for other sewer structures shall be of tough, even-grained, soft grey iron, free from burnt-on sand and other injurious defects, and of the approximate weight and dimensions shown on the drawings. Before leaving the foundry, castings shall be thoroughly cleaned, subjected to hammer test for soundness, and given two coats of coal tar pitch varnish.

7. SEWER CONSTRUCTION

a. Connections to Existing Sewers. Make or have made all required connections to existing sewers, including new manholes and other work required. Carry out such work in accordance with local standards and requirements. Observe extreme care to prevent debris from entering existing sewers to which connections are to be made.

b. Changes in Existing Sewers. Remove and relocate existing storm sewers including structures if required where designated on the plan, reusing any materials salvaged in undamaged condition.

(1) Adjustments to Finished Grade. Raise or lower existing manholes, street inlets, and catch basins as necessary to conform to finished grades. In raising manholes, cut down the walls far enough to permit extending the manhole in a diameter sufficient to permit easy entrance.

c. Sewers in Streets. Refer to Divison SPECIAL CONDITIONS Section 11, for construction of sewers and appurtenances in public rights of way, including rights of way to be dedicated. This contractor shall extend and connect project sewers to such existing or new sewers and appurtenances even though beyond the lines noted as defining the Limit of Work.

d. Sewer Pipe Laying. Commence at the lowest point in the system and lay the pipe with bell - or groove-end up-grade. Test pipe for soundness and clean interior and joint surfaces before lowering the pipe into the trench. Lay pipe in straight lines and on uniform grades between points where changes in alignment or grade are shown. Bed the pipe barrel uniformly (see "Trenching and Backfilling", above). Check the line and invert grade of each pipe from a top line carried on

batter boards not over 50 feet apart. Fit the pipes to form a smooth uniform invert. Immediately after each mortar joint is made, drag a close-fitting swab past the joint within the pipe. Keep a stopper in the pipe mouth when pipe laying is not in progress.

e. Sewer Pipe Jointing:

(1) Bituminous Joints. Comply fully with the directions of the manufacturer of the bituminous compound and with these requirements: Apply primer in advance to joint surfaces and keep such surfaces clean and dry during the jointing operation. Shove the spigot home and center accurately. Calk the gasket material tightly in place to approximately one-third of the joint depth and fill the remainder of the joint solidly with bituminous compound. Two lengths of pipe laid without injury to the joint.

(2) Mortar Joints in Bell and Spigot Pipe. Spread mortar in proper thickness in the bottom one-third of the circumference of the bell. Force into the mortar a gasket thick enough to center the spigot in the bell and long enough to lap at the top. After the pipe has been shoved "home", calk the gasket into place and ram mortar into the remainder of the joint space, bevelling off the mortar at a 45 degree angle.

(3) Cement Joints in Tongue and Groove Pipe. Wet the joint surfaces thoroughly. Spread mortar in the lower half of the groove and over the upper half of the tongue. After the pipe has been shoved "home", fill remainder of the joint space, inside and outside, with mortar and finish the outside with a bead or ring around the pipe. Wipe clean and smooth the joint on the interior of the pipe.

f. Backfilling Around Pipe. As soon as the joint material has set, pack fine earth carefully around the joints and place and tamp same around and over the pipe. Carry this backfill operation to a depth of at least 12 inches above the top of the pipe.

g. Sewer Structures.

(1) Masonry. Lay brick in manholes, inlets and other sewer structures with shove joints completely filled with mortar. Horizontal joints shall not exceed 1/2 inch, vertical joints 1/4 inch, on their interior face. In circular structures, lay all bricks as headers, breaking joints between courses. Strike interior joints smooth with the face of the wall. Plaster the exterior of sanitary sewer manholes to a thickness of at least 1/2 inch. Apply 1/2 inch plaster coat to the interior of catch basin sumps to a level 3 inches above the normal water line in the sump.

(2) Manhole Inverts. Construct manhole flow channels of concrete, sewer pipe or brick, and of semicircular section conforming to the inside diameter of the connecting sewers. Make changes in size or grade gradually and changes in direction by true curves. Provide such channels for all connecting sewers to each manhole.

(3) Drop Manholes. Provide drop inlets into manholes on sanitary and/or combined sewers for incoming lines having inverts 2 feet or more above the inverts of the manhole outlet lines. Encase drop pipe and fittings in masonry integral with the manhole and extending from the manhole base to the top of the incoming sewer.

(4) Setting Castings. Unless otherwise shown, set castings for manholes and cleanouts at exact finished grade and depress the grates of drainage openings to 3 inches below finished grade.

h. Flushing Sewers. Flush all sanitary sewers, except building connections, with water in sufficient volume to obtain free flow through each line. Remove all obstructions and correct all defects discovered. Remove all silt and trash from catch basins and inlets just prior to final acceptance of the work.

i. Infiltration. When the sewere are completed, furnish to the Local Authority a V-notch weir and/or other materials and all assistance requested for measuring the quantity of ground water entering the sewers. If such infiltration exceeds 8,000 gallons per mile of sewer per day for the entire system, or 16,000 gallons for any section thereof, the necessary corrective measures shall be taken to limit infiltration to the quantity above specified.

8. AS-BUILT DRAWINGS

As the work progresses, record on one set of utility drawings all changes and deviations from the contract drawings in sizes, line or grade. Record also the exact final location of sewer lines by offset distances to surface improvements such as buildings or curbs. Make sufficient measurements to locate definitely all utility lines. Reference underground bends, valves, end of sewers, etc., to building lines. Transfer accurately all such records in drawing ink to white prints of the utility drawings and deliver same to the Local Authority.

DIVISION 22a

UTILITIES (WATER)

1. SCOPE

This division includes all underground cold water distribution lines, appurtenances, and related items, including excavating and backfilling, required to complete the work indicated on the drawings, except water services from buildings to points five feet (5') outside of building walls, which items are specified in the division, PLUMBING.

a. Connections to Building Piping. The ends of water service lines shall be tightly plugged or capped 5 feet outside of building walls, pending the connecting thereto of the building piping as specified in the division PLUMBING.

b. Provide all materials and appurtenances necessary for the complete installation of this utility, whether or not all such materials and appurtenances are shown on the drawings or described in the specifications.

2. PERMITS AND CODES

The intent of this division of the specifications is that the Contractor's bid on the work covered herein shall be based upon the drawings and specifications, but that the work shall comply with all applicable codes and regulations as amended by any waivers. The Contractor's attention is directed to the Section, "Permits and Codes", of the GENERAL CONDITIONS.

3. LOCAL STANDARDS

The term, "local standards", as used herein, means the standards of design and construction of the respective municipal department or utility company.

4. EXISTING IMPROVEMENTS

Maintain in operation condition all active utilities, sewers, gutters and other drains encountered in the utility installation. Repair to the satisfaction of the owner any surface or subsurface improvement damaged during the course of the work, unless such improvement is shown to be abandoned or removed. (See also"Care of the Work" in the GENERAL CONDITIONS.)

5. TRENCHING AND BACKFILLING

a. General. Unless otherwise shown, provide separate trenches for each water line and maintain at least 3 feet of undisturbed earth between all water pipe trenches and between the trenches for water pipes and other utilities. Lay all piping in open trench except when the Local Authority gives written permission for tunneling. Maintain ready access to fire hydrants by fire-fighting apparatus.

b. Width of Trench. Excavate trenches of sufficient width for proper installation of the work.

c. Sheeting, Bracing, Water Removal. Sheet and brace trenches, and remove water, as necessary to fully protect workmen and adjacent structures and permit proper installation of the work. Comply with local regulations or, in the absence thereof, with the provisions of the "Manual of Accident Prevention in Construction", of the Associated General Contractors of America, Inc. Under no circumstances lay pipe or install appurtenances in water; keep the trench free from water until pipe joint material has hardened. The presence of ground water in the soil or the necessity of sheeting or bracing trenches shall not constitute a condition for which any increase may be made in the Contract Price, except that when sheeting is left in place, on the written order of the Local Authority, the Contract Price shall be adjusted (see GENERAL CONDITIONS). Sheeting left in place shall be cut off not less than 2 feet below finished grade. Sheeting shall not be removed until the trench is substantially backfilled.

d. Rock Excavation. Refer to Division 2, Section 2, Sub Surface Date, and Section 7, para. C, Rock Excavation. All material to be excavated shall be unclassified and no adjustments in Contract Price will be made on account of the presence or absence of rock, shale, masonry, or other materials. In the case of any change ordered in writing by the Local Authority, in the quantity of excavation, its value shall be determined in accordance with the Unit Prices established in the contract; and the Contract Price will be adjusted as provided in the GENERAL CONDITIONS.

e. Blasting. Obtain written consent and approval of method from the Local Authority before proceeding with blasting. Handle and employ explosives as stipulated in the division, EXCAVATING, FILLING AND GRADING. Cover blasts with heavy timbers or mats. Set off no blast within 25 feet of pipe already laid in the trench. Protect by earth backfill pipe already laid.

f. Grading Trench Bottom. Grade the bottom of trenches evenly to insure uniform bearing for the full length of all pipes. Cut holes as necessary for joints and joint-making. Excavate all rock, cemented gravel, old masonry, or other hard material to at least 4 inches below the pipe at all joints. Refill such space and all other cuts below grade with sand or fine gravel firmly compacted.

g. Special Supports. Should latent soil conditions, other than hard material as referred to above, necessitate special supports for piping and/or appurtenances, including the removing of unsuitable material and refilling with gravel or other material, the Contract Price will be adjusted (see GENERAL CONDITIONS). Perform any such work as directed by the Local Authority.

h. Tree Protection. Exercise care to protect the roots of trees to remain. Within the branch spread of such trees perform all trenching by hand. Open the trench only when the utility can be installed immediately; prune injured roots cleanly; and backfill as soon as possible. Perform all this work under direction of the Local Authority.

i. Backfilling. Backfill trenches only after piping has been inspected, tested and locations of pipe and appurtenances have been recorded. Backfill by hand around pipe and for a depth of one foot above the pipe; use earth without rock fragments or large stones and tamp firmly in layers not exceeding 6 inches in thickness, taking care not to disturb the pipe or injure the pipe coating. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper, or if the soil is granular by flooding, provided that under pavements, walks and other surfacing, the backfill shall be tamped solidly in layers not thicker than 6 inches. Exclude all cinders and rubbish from trenches in which metal pipes are laid.

6. WATER DISTRIBUTION SYSTEM MATERIALS

a. Pipe Materials - General. Underground cold water piping 2 inches or more in diameter shall be cast iron; such piping less than 2 inches in diameter shall be galvanized wrought iron. Provide proper fittings, except as otherwise shown or specified, at major changes in direction and at branch connections.

b. Pipe and Fittings:

(1) Two inch and larger cast iron pipe shall be Class 150, conforming to Federal Specification WW-P-421 or A.S.A. Specification A21.2-1939, provided that joints may be either bell and spigot or standardized mechanical joints. Fittings

shall comply with A.W.W.A. specifications for Class D special castings or with A.S.A. Specification A21.10 or Class 250 short-body fittings. Pipe and fittings shall be coated inside and out with coal tar pitch varnish. For 2 inch, 2½ inch or 3 inch, two tapping collars shall be cast in each length of pipe. Each pipe shall successfully withstand a hydrostatic test of 500 lbs. per sq. in. and each factory-assembled section a compressed air test of 50 lbs. per sq. in. Fittings shall be all-bell type, Class 250. All pipe and fittings shall be completely coated inside and out with coal-tar pitch varnish.

(2) Galvanized wrought iron pipe, 1½ inch and smaller, shall be standard (Class A) pipe meeting Federal Specification WW-P-441a. Fittings shall be galvanized, malleable iron, screwed, Class B, meeting Federal Specification WW-P-521b.

c. Pipe Jointing Material

(1) Yarning material shall consist either of braided hemp sterilized by a method approved by the Local Authority, or of milded or tubular rubber rings, asbestos rope, or treated paper rope free from oil, tar and grease. Yarning material shall be handled on the job with reasonable care to avoid contamination and shall be dry when used.

(2) Joint compound shall be lead conforming to Federal Specification QQ-L-156.

d. Valves.

All valves and stops shall have ends suited, or adaptors shall be provided, for proper installation in the lines in which they are located.

(1) Valves 2-inch and larger shall be iron-body, bronze or brass-mounted double gate valves conforming to A.W.W.A. standard specifications and meeting local standards. They shall open in the same direction as those used in the local water works system. Valve stems shall terminate in wrench nuts. Furnish two suitable keys.

(2) Valves 1½ inch and smaller shall be standard, brass-body, round-way, ground-key stops, with T-heads and checks. Furnish two suitable keys.

e. Valve boxes for 2 inch and larger valves shall be approved standard cast iron, adjustable-shaft boxes having a minimum shaft diameter of 5¼ inches. Boxes over valves (stops) 1½ inch and small shall be approved standard, cast iron, extension service boxes having a minimum diameter of 2½ inches, and having lid held in place by a brass bolt. The

castings shall be coated with two coats of coal-tar pitch varnish. The lids of all boxes shall bear the word "Water" or the letter "W".

f. Fire hydrants shown required and including water mains serving fire hydrants will be furnished and installed by the City of Athens, Georgia, without cost to the Contractor.

g. Water meters shall be of recognized make, meeting the approval of the local water department and complying with A.W.W.A. specifications for the type and size shown on the drawings.

7. WATER DISTRIBUTION SYSTEM INSTALLATION

a. Connections to Existing Mains. Make all required connections to existing water mains, arranging therefor with the local water department and carrying out the work to its satisfaction.

b. Handling and Storing Materials. Unload cast iron pipe by hoists or skidding so as to avoid shock or damage. Handle and store all pipe in such manner as to avoid deformation or other injury thereto. Place no pipe within pipe of a larger size. Store pipe and fittings on sills above storm drainage level and deliver for laying after the trench is excavated. Valves and hydrants shall be drained and so stored as to protect them from freezing.

c. Pipe-Laying - General. The interior of the pipe shall be clean and joint surfaces wiped clean and dry when the pipe is lowered into trench. Hammer-test cast iron pipe for soundness before lowering. Lower each pipe, fitting and valve into the trench carefully and lay true to line and without objectionable breaks in grade. The depth of cover below finished grade shall be not less than 2 feet. Give all pipes a uniform bearing on the trench bottom. Allow no trench water or dirt to enter the pipe after laying. Insert a watertight plug in the open end of the piping when pipe-laying is not in progress.

d. Pipe Laying and Jointing.

(1) Jointing Bell and Spigot Cast Iron Pipe. The spigot shall be driven "home" and centered in the bell with packing material tightly driven inplace, leaving a uniform depth of at least 2 inches for lead. Tamp sufficient earth along the sides of the pipe to hold it in place while completing the joint. Lead joints shall be placed at one pouring and walked watertight without straining the pipe. Calk

factory-made lead joints and field joints in cast iron pipe smaller than 3 inch to conform to the pipe manufacturer's specifications.

(2) Jointing Wrought Iron Pipe. Remove burrs and cuttings and ream or file pipe ends to the size of bore. Apply an approved lubricant on the male thread only and make joints full and tight.

e. Fittings and Branch Connections. Install suitable fittings at all changes in direction, dead ends and branch connections, provided that taps, in lieu of fittings, may be used as follows:

(1) On 3 inch and larger cast iron pipe, taps shall be not larger than 3/4 inch, 1 inch, 1¼ inch and 1½ inch, on 3 inch, 4 inch, 6 inch, and 8 inch and larger mains, respectively.

(2) On cast iron pipe smaller than 3 inch, taps shall be made only at tapping collars and in accordance with the manufacturer's recommendations.

f. Setting Valves. Before setting each valve make sure the interior is clean and test opening and closing. Set valves and stops with stems plumb and at the exact locations shown. Provide a brick laid flat or other similar foot-piece under each curb box. Valve and service boxes shall be plumb, with tops at finished grade. Tamp trench backfill thoroughly for a distance of 3 feet on each side of boxes.

g. Blocking. Pour concrete blocks between the undisturbed trench face and plugged ends and bends to prevent pipe movement at leaded joints; where the soil is not firm, provide, in lieu of concrete, approved tie rods and collars, painted with coal tar pitch varnish after placing.

h. Insulating Fittings. Insulating bushings or nipples shall be installed as the connection at each point throughout the system where cast ironpipe connects with copper and/or galvanized wrought iron pipe.

i. Meter Vaults and Meter Installations. Each water meter shall be installed in a vault of reinforced concrete with bottom and reinforced concrete top slab flush with grade and provided with a manhole cover and frame. The meter shall be installed with a bypass.

j. Tests. Before joints are covered, fill the piping with water, opening hydrants or other outlets as necessary for expelling the entrapped air. Thereafter, furnish the necessary equipment and test the piping, under the supervision of the Local Authority, for a period of at least two hours at a pressure of 150 lbs. per sq. in. Inspect all joints, and remedy to the satisfaction of the Local Authority any defects discovered. Continue the tests until all visible leaks, except as hereinafter specified, have been eliminated from the part of the system under test.

k. Flushing Mains. Immediately upon completion of the water distribution system, test all valves to insure their full opening and flush out the system as follows: Flush out the system until water runs clear. Use outlets in buildings to flush the upper ends of mains and service lines. During such flushing operation the Local Authority may test the flows from hydrants, and before final acceptance of the work, make further tests of hydrant flows to ascertain if the lines are clear.

l. Sterilization of Water Distribution System. As soon as the water distribution system has been flushed out as above specified, it shall be sterilized by the following or other method satisfactory to the Local Authority.

(1) Introduce chlorine or a solutionof calcium or sodium hypochlorite, filling the lines slowly and applying the sterilizing agent at a rate of 50 parts per million of chlorine, as determined by residual chlorine tests at the ends of the lines. Open and close all valves and hydrants while the system is being chlorinated.

(2) After the sterilizing agent has been applied for 24 hours, test for residual chlorine at the ends of the lines. If less than 5 p.p.m. is indicated, repeat the sterilization process.

(3) When tests show at least 5 p.p.m. of residual chlorine, flush out the system until all traces of the chemical used are removed.

The Local Authority reserves the right to test the water again at any time prior to final acceptance of the work and, if found unsafe bacteriologically, to require the Contractor to rechlorinate the system until the water is proven equal to that supplied by the public system.

8. CERTIFICATES

Furnish to the Local Authority affidavits from the manufacturers of the pipe, pipe coating, fittings, valves, meters and fire hydrants furnished and installed under this division, certifying that such materials delivered to the project conform to the requirements of this specification.

9. AS-BUILT DRAWINGS

As the work progresses, record on one set of utility drawings all changes and deviations from the contract drawings insizes, line or grade. Record also the exact final location of water lines by offset distances to surface improvements such as buildings or curbs. Make sufficient measurements to locate definitely all utility lines. Reference underground bends, valves, ends of sewers, etc., to building lines. Transfer accurately all such records in drawing ink to white prints of the utility drawings and deliver the same to the Local Authority.

DIVISION 23

LAWNS AND PLANTING

1. SCOPE

This division includes furnishing all materials, equipment and labor necessary for preparation of final subgrades in lawn and planting areas; tree wells and root protection; finished grading; soil treatment; lawn construction; planting of trees, shrubs, and vines; protection, maintenance, guarantee, and replacement of lawns and plants; and related items required to complete the work indicated on the drawings and specified except: (1) protection of existing trees and shrubs, specified in the division DEMOLITION AND CLEARING OF SITE; (2) Protection, pruning, and repair of existing trees and shrubs to remain, and tree removal; (3) restrictions regarding material used for fill; and (4) rough grading of subgrade to a point approximately 3 inches below finished grade established for lawn and planting areas, specified in the division EXCAVATING, FILLING AND GRADING, which operations are to be completed before the work of lawns and planting can proceed.

2. MATERIALS

a. Topsoil to be Furnished. The quantity of topsoil at the site being negligible in quantity sufficient topsoil shall be furnished from off the site at no expense to the Local Housing Authority. Topsoil furnished shall be a natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally well-drained areas. It shall not be excessively acid or alkaline nor contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall be cleaned and reasonably free from clay lumps, stones, stumps, roots, or similar substances two inches or more in diameter, debris, or other objects which might be a hindrance to planting operations.

b. Manure shall be well-rotted, unleached, stable or cattle manure, reasonably free from shavings, sawdust, or refuse, and shall not contain any harmful materials.

c. Lime shall be ground limestone containing not less than 85 percent of total carbonates and shall be ground to such a fineness that 50 percent will pass through a 100-mesh sieve and 90 percent will pass through a 20-mesh sieve.

Coarser material will be acceptable, provided the specified rates of application are increased proportionately on the basis of quantities passing the 100-mesh sieve.

d. Commercial fertilizer shall be 4 - 12 - 4 formula, and shall conform to the applicable state fertilizer laws. It shall be uniform in composition, dry and free flowing and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.

e. Moss peat shall be brown; acid reaction about 4 to 5 pH; low in content of woody material and free of mineral matter harmful to plant life; water absorbing capacity, 1100 to 2000 percent; moisture content 30 percent; natural, shredded or granulated.

f. Water used in this work will be furnished by the Local Authority and will be suitable for irrigation and free from ingredients harmful to plant life. Hose and other watering equipment required for the work shall be furnished by this contractor.

g. Screen shall be 1/2-inch mesh galvanized hardware cloth.

h. Materials for Staking, Guying, and Wrapping.

(1) Stakes for supporting trees and shrubbery guards shall be "I" or channel section, furnished as shown on the drawings, to be galvanized steel Drive in Post with anchor and of section to provide sufficient stability for the purpose intended.

(2) Wire for fastening trees to stakes and at wire shrubbery guards shall be No. 12 gauge pliable, galvanized iron.

(3) Hose to encase wires used for fastening trees to stakes shall be new or used 2-ply reinforced rubber garden hose.

(4) Wrapping material for tree trunks shall be standard burlap, heavy crepe paper, or other suitable material, in strips 6 to 10 inches wide.

i. Lawn Materials

(1) Sprigs shall be Bermuda grass. They shall be healthy, vigorous, freshly dug, free of pernicious weeds, and shall be properly protected until planted.

(2) Sod shall be at least 60 percent Bermuda grass; strongly rooted, and free of pernicious weeds. It shall be mowed to a height not to exceed 3 inches before lifting and shall be of uniform thickness with not over 1-1/2 inches or less than 1 inch of soil.

j. Plant Materials

(1) Plant List. A list of plants is shown on the planting plan.

(2) Nomenclature. The names of plants required under this contract conform to those given in Standardized Plant Names, 1942 Edition, prepared by the American Joint Committee on Horticultural Nomenclature. Names of varieties not included therein conform generally with names accepted in the nursery trade.

(3) Quantities. Quantities necessary to complete the planting as shown and located on the drawings shall be furnished. The contractor may at his option furnish the plant material listed as an alternate in any instance, provided matched plantings are used wherever shown.

(4) Quality and Size. Plants shall have a habit of growth that is normal for the species and shall be sound, healthy, vigorous, and free from insect pests, plant diseases, and injuries. All plants shall equal or exceed the measurements specified in the Plant List, which are minimum acceptable sizes. They shall be measured before pruning, with branches in normal position. Any necessary pruning shall be done at time of planting. Requirements for the measurement, branching, grading, quality, balling and burlapping of plants in the Plant List generally follow the code of standards currently recommended by the American Association of Nurserymen, Inc., in the American Standard for Nursery Stock.

(5) Substitutions will be permitted only upon submission of proof that any plant is not obtainable locally and authorization by the Local Authority of a change order providing for use of the nearest equivalent obtainable size or variety of plant having the same essential characteristics with an equitable adjustment of contract price.

(6) Type of Protection to Roots

(a) Balled and Burlapped Plants. Plants designated "B&B" in the Plant List shall be balled and burlapped. They shall be dug with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Balls shall be firmly wrapped with burlap or similar material and bound with twine, cord, or wire mesh. Where necessary to prevent breaking or cracking of the ball during the process of planting, the ball may be secured to a platform.

(b) Bare-Root Plants. Plants designated "BR" in the Plant List shall be dug and the earth removed without injury to the fibrous root system necessary for the full recovery of the plant. Roots shall be covered with a thick coating of mud by puddling or wrapped in wet straw, moss, or other suitable packing material immediately after they are dug, for protection until delivered.

(c) Protection after Delivery. The balls of "B&B" plants which cannot be planted immediately on delivery shall be covered with moist soil or mulch, or other protection from drying winds and sun. Bare-rooted plants shall be planted or heeled in immediately upon delivery. All plants shall be watered as necessary until planted.

3. SAMPIES, TESTS, AND INSPECTIONS

a. Notice of Sources. Within ten days following acceptance of the bid, the Local Authority shall be notified of the sources of the materials required or desired to be inspected or tested.

b. Topsoil to be Furnished. The Local Authority will inspect topsoil to be furnished at its source, to determine whether or not it meets the requirements specified and to approve the depth to which it may be stripped. At the time of inspection, the contractor may be required to take representative soil samples, under the directionof the Local Authority, to the proposed stripping depth, from several locations in the area under consideration. If samples are required, tests will be made by a state or commercial soil testing laboratory using methods approved by the Association of Official Agricultural Chemists or the State Agricultural Experiment Station. Delivery of topsoil may begin after approval of the sample.

c. Plants. The contractor shall be responsible for all certificates of inspection of plant materials that may be required by Federal, State, or other authorities to accompany shipments of plants. Inspection of plants to be balled and burlapped will be made at the place of growth. All plants must be inspected and approved before they are planted. Inspection and approval by the Local Authority of plants at the place of growth or upon delivery shall be for quality, size, and variety only and shall not in any way impair the right of rejection for failure to meet other requirements during progress of the work.

4. CONSTRUCTION METHODS

a. Time of Planting. The contractor shall be notified in writing by the Local Authority, when other divisions of the work have progressed sufficiently, to commence work of lawns and planting, including placing of topsoil to finished grade. Thereafter, planting operations shall be conducted under favorable weather conditions during the next specified season or seasons. The planting season for trees, shrubs, and vines shall be between 1 November and 15 March inclusive; Bermuda grass lawns may be planted between 1 April and 1 September inclusive. If establishment of a Rye grass lawn is necessary for a temporary measure, this shall be done between 15 September and 1 February inclusive.

b. Existing Trees to Remain

(1) Temporary structures erected for the protection of existing trees during construction required under divisions, DEMOLITION AND CLEARING OF SITE and EXCAVATING, FILLING AND GRADING, shall be removed only when necessary to facilitate the work of LAWNS AND PLANTING.

(2) Permanent tree-root protection shall be provided where indicated for existing trees as shown on the drawings.

(3) The area for tree-root protection shall be considered as that over which the branches spread. The objective of tree-root protection is to maintain the normal air and water content and fertility of the soil about the tree. Before making a fill, remove the vegetation, sod, leaf litter, and other organic matter from beneath the trees and loosen the surface soil. Care shall be taken that the trees and their roots are not damaged by construction operations.

(4) Lowering Grades. Where the existing grade at the base of the tree trunk is above the required finished grade level, the ground from the outer edge of the area of tree-root protection shall be sloped to the surrounding subgrade level without abrupt change in grade. Dry retaining walls shall be constructed and soil treated as shown on the drawings.

(5) Raising Grades Less Than 8 Inches. Where existing grades beneath the spread of the branches is less than 8 inches below the finished grade level, the existing soil surface shall be prepared by removing organic matter, loosening the surface soil, and evenly distributing 4 - 12 - 4 formula commercial fertilizer within the area at the rate of 3 pounds for each inch of tree trunk diameter. An 18-inch ring of 3/4-inch broken stone or washed gravel shall be placed around the trunk from the natural grade to within 3 inches of finished grade and covered with a 1-inch layer of straw, dry hay, pine needles, or inverted sod. The area beneath the spread of the branches shall then be brought to finished grade level with soil as specified for adjacent areas.

(6) Raising Grades 8 to 30 Inches. Where existing grades beneath the spread of the branches are 8 to 30 inches below the finished grade level, the existing soil surface shall be prepared by removing organic matter, loosening the surface soil, and evenly distributing 4 - 12 - 4 formula commercial fertilizer within the area at the rate of 3 pounds for each inch of tree trunk diameter. Broken stone or washed gravel 1/2 to 2 inches in size shall be spread over the area to the following depths:

Depth of Required Fill	Depth of Stone or Gravel
8 inches	2 inches
9 inches	3 inches
10 inches	4 inches
11 inches	5 inches
12 inches or more	6 inches

This layer of porous aggregate shall then be covered with a 1-inch layer of straw, dry hay, pine needles, or inverted sod. Four-inch agricultural tile shall be placed upright approximately 8 feet apart over the area beginning 8 feet from the trunk and placed at the outer ring or edge and above the porous aggregate, and extending to the surface at finished grade level. The vertical tile shall be filled with washed gravel topped with coarse sand. Within 18 inches of the trunk the broken stone or washed gravel shall extend from natural grade to within 3 inches of finished grade. Materials for filling to the finished grade level shall be in accordance with those specified for adjacent areas.

c. Fertilizing Existing Trees. Existing trees shall be fertilized at the beginning of their growing season with 4 - 12 - 4 formula commercial fertilizer applied at the rate of three pounds per inch of the trunk diameter. Holes for fertilizer shall be spaced from 2 to 3 feet apart within the area beneath the spread of the branches and shall be of sufficient depth to effectively reach the feeding roots. Fertilizer shall be placed in each hole at a uniform rate not to exceed one-half pound per hole and well watered in, after which the hole shall be filled to finished grade with peat and sand.

d. Spraying. Infected existing trees shall be sprayed to prevent the spread of disease and insect pests to new plantings. Materials and methods used shall not cause injury to persons or structures.

e. Pruning and Repair. Upon completion of the work under this contract, all trees and shrubs shall have been pruned and any injuries repaired. The amount of pruning shall be limited to the minimum necessary to remove dead or injured twigs and branches and in accordance with the best horticultural practice to compensate for the loss of roots as a result of transplanting operations. Pruning shall be done in such a manner as not to change the natural habit or shape of the plant. All cuts shall be made flush, leaving no stubs. On all cuts over 3/4 inch in diameter and bruises or scars on the bark, the injured cambium shall be traced back to living tissue and removed; wounds shall be smoothed and shaped so as not to retain water; and the treated area shall be coated with shellac.

f. Obstructions Below Ground or Overhead

(1) It is not contemplated that planting shall be done where the depth of soil over underground construction, obstructions or rock is insufficient to accommodate the roots or where pockets in rock or impervious soil will require drainage. Where such conditions are encountered in excavation of planting areas and where the stone, boulders, or other obstruction cannot be broken and removed by hand methods in the course of digging plant pits of the usual size, and where trees to be planted are found to be under overhead wires, other locations for the underground construction or overhead wires or for the planting may be designated by the Local Authority.

(2) Removal of rock or other underground obstructions, relocation of construction, and provision of drainage for planting areas shall be done only as directed by the Local Authority.

(3) If changes in the location of the work or if the removal of rock or other obstructions involves additional work, the Contractor shall proceed in accordance with Section 10 of the General Conditions.

g. New Planting.

(1) Layout. New Planting shall be located where shown on the plans excepting where obstructions below ground or overhead are encountered or where changes have been made in the construction. Necessary adjustments shall be approved by the Local Authority. No planting excepting ground cover and vines shall be placed closer than two feet to pavements or structures, and no trees shall be planted closer than five feet from pavements or twenty feet from structures.

(2) Planting pits shall be dug and soil for planting ready before plants are delivered. Circular pits with vertical sides shall be excavated for all plants except for hedge and plants specifically designated on the plans to be planted in beds. Diameter of pits for trees and B&B shrubs and vines shall be at least two feet greater than the diameter of the ball or spread of roots. Diameter of pits for bare-rooted ("BR") shrubs and vines shall be at least one foot greater than the spread of roots. The depth of pits for trees, shrubs and vines shall be enough to accommodate the ball or roots when the plant is set to finished grade allowing for 3 inches of compacted topsoil or prepared soil in the bottom of the pit.

(3) Soil Preparation. Soil used in planting shall be topsoil, as hereinbefore specified, or suitable existing soil thoroughly mixed with one part of peat and one part of manure to five parts of existing soil. Very poor soils, gravel, hard-pan, or other soil injurious to plants shall not be used. Except for ericaceous plants, very acid or sour soil (having a pH of less than 6) shall be thoroughly mixed with sufficient lime to produce a slightly acid reaction (a pH of 6 to 6.5). Soil used in planting shall be thoroughly mixed with 5 pounds of 10-6-4 formula commercial fertilizer per cubic yard.

(4) Excess excavated soil shall be disposed of where and as directed by the Local Authority.

(5) Setting Plants. Unless otherwise specified, all plants shall be planted in pits, centered, and set on 3 inches of compacted topsoil or prepared soil to such depth that the finished grade level at the plant after settlement, will be the same as that at which the plant was grown. They shall be planted upright and faced to give the best appearance or relationship to adjacent structures. No burlap shall be pulled out fromunder balls. Platforms, wire, and surplus binding from top and sides of the balls shall be removed. Roots shall be spread

in their normal position. All broken or frayed roots shall be cut off cleanly. Topsoil or prepared soil shall be placed and compacted carefully to avoid injury to roots and to fill all voids. When the hole is nearly filled, add water as necessary and allow it to soak away. Fill the hole to finished grade, and form a shallow saucer around each plant by placing a ridge of topsoil around the edge of each pit. After the ground settles, additional soil shall be filled in to the level of the finished grade.

(6) Staking and Wrapping. Trees shall be supported immediately after planting. Wires shall be encased in hose to prevent direct contact with bark of the tree and shall be placed around the trunk in a single loop. Wires shall be tightened and kept taut by twisting the strands together.

(a) Staking. Stakes shall be equally spaced about each tree and shall be driven vertically into the ground to a depth as shown in such manner as not to injure the ball or roots. Trees shall be fastened to each stake at a height of about 5 feet by means of two strands of wire. Stakes shall be uniform in height and placed according to the diameter of the tree trunk, as follows:

2 inch and over - 3 stakes

Less than 2 inch - 1 stake

(b) Wrapping. Promptly after planting, the trunks of all trees designated to be wrapped shall be wrapped spirally from the groundline to the height of the second branches. All wrapping shall be neat and snug and the material shall be held in place by a suitable cord.

(c) At group planting of shrubs, provide wire shrub and metal post guards similar as shown, with spacing of posts varied as necessary to suit the shrub spacing and length of planted areas.

(7) Hedge Planting. Hedge plants shall be planted in trenches excavated to a depth of at least one foot and to a width of one foot wider than the total spread of the roots or diameter of balls when placed in the number of rows specified. Plants shall be evenly spaced along or equally distant from the center line of the trench.

(8) Vines. Vines shall be planted in pits containing at least one dubic foot of topsoil or prepared soil thoroughly mixed with one-third peat. Vines shall be planted in contact with the wall or other support on which they are to grow. Each vine shall be protected by two stakes.

(9) Mulching. All plants shall be mulched with a 2-inch layer of well rotted manure within 2 days after planting. This mulch shall entirely cover the area of the planting pit, bed, or saucer around each plant.

h. Lawns

(1) All areas not required to be developed otherwise shall be planted to grass.

(a) If construction is completed at a time out of season as specified for sprigging and sodding with Bermuda grass, all areas not required to be developed otherwise shall be seeded to Italian Rye at the rate of 5 lbs to every 100 sq. ft. Fertilizer will not be required in connection with the planting of rye grass, fertilizer only to be applied in connection with planting of the Bermuda, as specified.

(2) Preparation of Subgrade. The subsoil shall be graded and uniformly compacted so that it will be parallel to proposed finished grade.
The subgrade material shall be loosened and mixed to a depth of 2 to 4 inches and all stones over two inches in size, sticks and rubbish removed. No heavy objects except lawn rollers shall be moved over lawn areas after the subgrade soil has been prepared, unless the subgrade soil is again graded and loosened as specified above before topsoil is spread.

(3) Finished Grading - Lawn Areas. After the subgrade soil has been prepared, topsoil shall be spread evenly thereon and lightly compacted. No topsoil shall be spread in a frozen or muddy condition.

(a) Areas to be seeded or sprigged shall be brought to finished grade and smoothed.

(b) Areas to be sodded shall be brought to within the thickness of the sod of the finished grade.

(c) Allowance for settlement shall be made.

(d) Areas where the topsoil has not been removed shall be scarified, smoothed, and sticks, stones and rubbish shall be removed.

(4) Applying Lime. Lime shall be applied at the rate recommended by a commercial or State soil testing laboratory to provide a pH of 6 to 6.5 for the topsoil furnished.

(5) Applying Fertilizer. Commercial fertilizer shall be applied at the rate of 30 pounds to 1000 square feet to the lawn areas being prepared for planting. Fertilizer may be applied with seed.

(6) Planting of Lawns. Lawn areas shall be planted with Bermuda grass, first sprigging and then over-seeding between the furrows as specified.

(a) Row Sprigging. Furrows 12 inches apart, preferably parallel with contours, shall be opened to the depth necessary to insure covering of sprigs to a depth of 2 inches after compaction. As soon as practicable after opening, before soil is dried out, sprigs shall be placed in the furrows continuously with the ends overlapping. The sprigs shall be covered immediately, the surface levelled to established grade, cleaned, suitably compacted, and thoroughly soaked by watering with a fine spray. The method of planting sprigs may be varied at the discretion of the contractor on his own responsibility to establish a smooth, uniformly grassed lawn.

(b) Sowing of Seed. Immediately before any seed is to be sown, the ground shall be scarified as necessary and shall be raked until the surface is smooth, friable, and of uniformly fine texture. Lawn areas shall be seeded evenly with a mechanical spreader at the rate of 3 pounds to 1000 square feet of area, lightly raked, rolled with a 200 pound roller, and watered with a fine spray. The method of seeding may be varied at the discretion of the contractor on his own responsibility to establish a smooth, uniformly grassed lawn.

(7) Laying of Sod. Before any sod is laid all soft spots and inequalities in grade shall be corrected. Fertilizer spread shall be raked in. Sod shall be laid so that no voids occur and tamped or rolled. Screened topsoil shall be brushed or raked over the sodded area and the sod shall then be thoroughly watered. The completed sodded surface shall be true to finished grade, even and firm at all points.

(a) Sod on slopes steeper than 2 to 1 shall be held in place by wooden pins about one inch square and about six inches long driven through the sod into the soil until they are flush with the top of the sod.

(b) Strip or spot sod shall be placed so that the surface of the compacted sod will be slightly below the surrounding surface soil.

(8) Slopes or Banks. Solid sodding or sodding in strips 12 inches wide at 24 inches on center intervals will be required on all grassed areas having a slope of 2 feet horizontal to 1 foot vertical or steeper. At the option of the contractor, sod may be used for establishing grass on other slopes, banks, and lawn areas, with the understanding that specified coverage must be established on all areas before acceptance.

i. Clean-up. Any soil, manure, peat or similar material which has been brought onto paved areas by hauling operations or otherwise shall be removed promptly, keeping these areas clean at all times. Upon completion of the planting, all excess soil, stones, and debris which has not previously been cleaned up shall be removed from the site or disposed of as directed by the Local Authority. All lawns and planting areas shall be prepared for final inspection.

5. MAINTENANCE

Maintenance shall begin immediately after each portion of lawn and each plant is planted and shall continue in accordance with the following requirements:

a. Lawns shall be protected and maintained by watering, mowing, and replanting as necessary for at least 30 days after completion of last lawn operations and as much longer as is necessary to establish a uniform stand of the specified grasses and until Acceptance. Scattered bare spots, none of which is larger than one square foot, will be allowed up to a maximum of 3 per cent of any lawn area.

b. New planting shall be protected and maintained until the end of the lawn maintenance period, or, if installed after the lawn maintenance period, until installation of planting is complete. Maintenance shallinclude watering, weeding, cultivating, mulching, tightening and repairing of guys, removal of dead material, resetting plants to proper grades or upright position and restoration of the planting saucer, and other necessary operations. If planting is done after lawn preparation, proper protection to lawn areas shall be provided and any damage resulting from planting operations repaired promptly.

c. Repairs to lawns or replacements of plants necessary during the maintenance period due to removal, loss or damage resulting from occupancy of dwelling units, vandalism, or acts of neglect on the part of others shall be made by the contractor without additional expense to the Local Authority.

6. INSPECTION FOR ACCEPTANCE.

a. Inspection of the work of LAWNS AND PLANTING to determine completion of contract work, exclusive of the possible replacement of plants, will be made by the Local Authority at the conclusion of the maintenance period upon written notice requesting such inspection submitted by the Contractor at least 10 days prior to the anticipated date. The condition of Lawns will be noted and determination made by the Local Authority whether maintenance shall continue in any part.

b. Acceptance. After Inspection, the Contractor will be notified in writing by the Local Authority of acceptance of all work of this Division, LAWNS AND PLANTING, exclusive of the possible replacement of plants subject to guaranty, or if there are any deficiencies, of the requirements for completion of the work. Lawn Maintenance or other work remaining to be done shall be subject to reinspection before Acceptance.

c. Acceptance in Part. The work of LAWNS AND PLANTING will be accepted in part by the Local Authority upon written application by the Contractor provided the work offered for acceptance comprises all of the work of this Division entirely completed, including Lawn Maintenance, but exclusive of the possible replacement of plants, located within a continuous area which is a substantial portion definitely separated from the remainder of the site by roads, walks, fences, other structural barriers, or readily defined topographical features.

7. PLANT GUARANTY AND REPLACEMENT

a. Guaranty. Plants shall be guaranteed for a maximum of one year or for the duration of one full growing season, beginning April 15 and ending November 1, after planting, and shall be alive and in satisfactory growth at the end of the guaranty period.

b. Replacement. At the end of the guaranty period, inspection will be made by the Local Authority upon written notice requesting such inspection submitted by the Contractor at least 10 days before the anticipated date. Any plant required under this contract that is dead or not in satisfactory growth, as determined by the Local Authority, shall be removed from the site; these and any plants missing, due to the Contractor's negligence, shall be replaced as soon as conditions permit, but during the normal planting season. In case of any question regarding the condition and satisfactory establishment of a rejected plant, the Contractor may elect to allow such plant to remain through another complete growing season at which time the rejected plant if found to be dead, in an unhealthy or badly impaired condition, shall be replaced.

c. Materials and Operations. All replacements shall be plants of the same kind and size as specified in the plant list. They shall be furnished and planted as specified under New Planting; the cost shall be borne by the Contractor, including cost of any possible replacements resulting from removal, loss or damage due to occupancy of the project in any part, vandalism, or acts of neglect on the part of others.

d. Costs of Plant Replacements. A sum sufficient to cover the estimated cost of possible replacements, including materials and labor, will be retained by the Local Authority and paid the Contractor only after all replacements have been made and approved.

DIVISION 24

SUPPLEMENTARY CONDITIONS FOR MECHANICAL AND ELECTRICAL DIVISIONS

24-1. SCOPE:

(1) This Division includes items related to the PLUMBING, HEATING AND ELECTRICAL Divisions, required to complete the work indicated on the drawings and specified.

24-2. MATERIALS AND EQUIPMENT:

(1) Eight (8) copies of the following list of materials and equipment, the name of manufacturer, trade name, type, and catalogue number shall be submitted to the Local Authority for approval. The lists shall be accompanied by eight (8) sets of pictorial and descriptive data derived from the manufacturer's catalogues, sales literature, or incorporated in the shop drawings. Data for the respective trades and for the plumbing fixtures and plumbing trim shall be bound in separate folios.

Plumbing and Heating Material and Apparatus

Items	Name of Manufacturer	Catalogue No., Type Trade Name
Plumbing fixtures	_____	_____
Forced air heating units	_____	_____
Grilles	_____	_____
Automatic storage water heaters	_____	_____
Space heaters	_____	_____
Sill Cocks	_____	_____
Valves, general	_____	_____
Gas cocks	_____	_____
Pressure and temperature relief valves	_____	_____

Name and address of agent furnishing service for water heaters _____

_____

(Plumbing Material and Apparatus) - Continued

Items	Name of Manufacturer	Catalogue No., Type Trade Name
Pipe and fittings (copper)		
Soil pipe and fittings (cast iron)		
Pipe, steel		
Pipe fittings, cast iron		
Pipe fittings, malleable iron		
Insulation - covering		
Insulating Unions (Dielectric)		
Pipe hangers, (steel pipe)		
Pipe hangers, (copper pipe)		
Pipe hangers, (Cast Iron Pipe)		
Vent flues for water heaters and space heaters		
Sleeves and escutcheons		

Electrical Material and Equipment

Items	Name of Manufacturer	Catalogue No., Type Trade Name
Boxes and covers, outlet		
Cable and conductors, interior		
Conduit		
Connectors, wire		
Fittings, conduit		
Lighting fixtures, Interior		
Lighting fixtures, exterior		

(Electrical Material and Equipment) - Continued

Items	Name of Manufacturer	Catalogue No., Type Trade Name
Fuses, cartridge		
Fuses, plug		
Lamp bulbs, incandescent		
Panels and cabinets, dwelling unit...		
Panels and cabinets, metering.....		
Plates, switches and receptacles		
Receptacles, general		
Receptacles, special		
Roof flasning, lead service mast		
Supports, cable		
Switches, service or entrance		
Switches, wall		
Tape, friction and rubber		

24-3 INSTALLATION REQUIREMENTS:

(1) Layout of equipment, accessories, pipe or duct, is generally diagrammatic unless specifically dimensioned.

(2) Coordinate the work of the MECHANICAL and ELECTRICAL Divisions to avoid interference of work indicated and to secure maximum head-room.

(3) Singular number. In all cases where a device or part of the equipment is herein referred to in the singular number (such as a lavatory) it is intended that such reference shall apply to as many such items as are required to complete the installation.

24-4 PERMITS, CERTIFICATES, CODES, AND ORDINANCES:

(1) The intent of the ELECTRICAL and MECHANICAL Divisions is that the contractors for these Divisions shall base their bids upon the plans and specifications, but each installation shall comply with the following applicable code, ordinance and/or rule and regulation, except to the extent that the Local Authority may have obtained waivers of certain requirements of the Codes. The contractor's attention is directed to Section _____ of the GENERAL CONDITIONS, "Permits and Codes."

(2) Electrical

a. Local Electrical Code and/or ordinances (Interior Installation).

b. National Electrical Code (Interior Installation).

c. Local Utility Company Standards (Overhead Installation).

(3) Plumbing

a. Local Plumbing Code and/or ordinances.

b. American Standard National Plumbing Code (ASA A40.8-1955).

c. Local Utility company gas piping regulations.

d. National Board of Fire Underwriters' Pamphlet No. 54 for the installation of Gas Piping and Gas Appliances in Building:

24-5 INSULATION, PIPING, HANGERS, AND INSERTS:

(1) Pipe insulation may be installed whenever the contractor elects, with the understanding that should defects develop at the time of inspection and tests, the insulation shall be removed, defects corrected and new insulation installed without expense to the Local Authority.

(2) Exposed piping inside of buildings shall be installed parallel to building lines, unless otherwise indicated or specified. Install piping at uniform grade and support on multiple hangers wherever practical.

(3) Inserts shall be cast iron or fabricated galvanized iron or steel and of the type to receive a machine bolt head or nut after installation and permit adjustment of this bolt in a horizontal direction. Inserts, where installed in cured concrete, shall be capable of developing the full strength of bolt. Inserts shall be flush with the concrete surface (after removal of forms).

(4) Hangers for all piping shall be clevis or split ring type unless otherwise specified or indicated, with provisions for vertical adjustment, except that hangers supporting copper tubing may be copper-plated steel or brass or bronze. When steel hangers are installed the copper tubing shall be cleaned, and wrapped with plastic insulating tape at the point of contact of the hanger. Hangers shall be supported from rods fastened to building construction. (Wire or perforated strap iron will not be permitted for pipe or conduit supports.)

24-6. ELECTRICAL WIRING:

(1) Electrical wiring, including distribution panels, cabinets, supports, feeders, circuit wiring and electrical connections to equipment, fixtures, and devices shall be provided under the Division "INTERIOR ELECTRICAL WIRING" unless specifically called for in another division of these Specifications.

(2) The motor-control apparatus shall be furnished complete as a part of the motor and apparatus which it operates, and the control apparatus shall be complete, factory wired and tested, ready for connection to be made under the "INTERIOR ELECTRICAL WIRING" Division of the Specifications.

24-7. MOTORS:

(1) All Motors shall be in accordance with the latest standards of the American Institute of Electrical Engineers and the National Electrical Manufacturers Association and also as hereinafter specified; designed for specific voltage available and for continuous duty, 40 degree C. rise.

24-8. CONTROL EQUIPMENT:

(1) Motor control and starting equipment shall be in accordance with the latest standards of the National Electrical Manufacturers Association and also as hereinafter specified. They shall be designed for their specific function and be of a type which will provide operation as specified under the respective divisions.

DIVISION 25

PLUMBING AND HEATING

Attention is called to the "Supplementary Conditions for Mechanical and Electrical Divisions".

25-1 SCOPE:

(1) This division includes all plumbing and heating work and related items required to complete the work indicated on the drawings and specified. All plumbing and heating work shall conform to all applicable State, County and City laws, ordinances and regulations, and shall include but is not limited to the following:

a. Drainage systems within the buildings and to 5 feet outside the buildings, including connections to the outside sewage lines.

b. Hot and cold water systems within the buildings and cold water supply lines to 5 feet outside the buildings, including connections to the cold water distribution system.

c. Plumbing fixtures and trim including the setting of fixtures and their connection to the drainage and water supply systems.

d. Gas water heaters and gas fired space heaters for all buildings shall be provided under this contract and connected to the gas supply and gas vent piping. Also gas ranges shall be delivered to the job and set in place.

e. Gas piping systems within the buildings and to the gas meters outside the buildings, including connections to all gas appliances and equipment. Gas piping shall conform to the regulations of the utility company and applicable portions of NBFU Pamphlet No. 54. Gas piping shall be terminated with capped ends 24" above finished grade at locations indicated on the drawings. At these points the utility company will make connections to meters.

25-2 MATERIALS:

(1) Materials shall be new and shall conform to the Federal Specification or other standard specification listed with each item, as follows:

a. Pipe and fittings shall conform to the following:

1. Cast-iron soil pipe and fittings - Federal Specification WW-P-401.

(MATERIALS) - Continued

2. Cast-iron drainage fittings - Federal Specification WW-P-491a.

3. Malleable-iron screwed fittings - Federal Specification WW-P-521b. Type 1 for gas piping.

4. Copper tubing - Federal Specification WW-T-797 or WW-T-799a.

5. Soldered joint fittings - American Standard A-40.3.

6. Steel pipe - Federal Specification WW-P-406, Type I, Class A, black for gas piping.

b. Underground soil, waste and drainage piping within the buildings and to 5 feet outside the buildings shall be extra-heavy cast-iron soil pipe and fittings. Except provide copper tubing, type "L", with wrought-copper solder-joint fittings, for bathtub wastes. Provide copper to male pipe thread couplings for connections to drum traps.

c. Above ground soil, waste and vent piping shall be:

1. Service weight cast iron soil pipe and fittings, for piping larger than 1-1/2 inches.

2. Standard weight galvanized steel pipe with cast-iron drainage fittings (standard galvanized cast-iron or malleable iron steam pattern fittings for vent piping only, for piping smaller than 2 inches, except as otherwise specified.

d. Underground water piping shall be:

1. Copper tubing, type K, with wrought-copper solder joint fittings. No fittings shall be installed under floor slabs on ground.

e. Above ground hot and cold water piping shall be:

1. Copper tubing, type "L", with wrought-copper solder-joint fittings for hot water and cold water.

f. Gas piping and fittings shall be standard weight black steel pipe with standard weight malleable iron fittings.

1. Underground gas piping shall be given a protective coating of asbestos felt paper as made by Nicollet Industries Inc., over Polypen protective tape or the piping shall be factory wrapped with asbestos felt, coal tar saturated over coal tar enamel in accordance with U. S. Navy Bureau of Yards and Docks Specification 34YB.

g. Threads for screwed fittings shall be American National taper pipe thread conforming to Federal Specification GGG-P-351a.

(8) h. Valves 3/4 inch and smaller shall be globe valves; larger sizes shall be solid wedge gate valves. Valves shall be brass or bronze. All valves shall be the 125-lb type that can be repacked under pressure when wide open. Bronze globe valves shall conform to Federal Specification WW-V-51a, bronze gate valves shall conform to Federal Specification WW-V-54. Valves shall have soldered (sweat) type ends or appropriate adapters.

i. Unions

1. For iron and steel piping. All unions shall be 125-lb brass ground-joint type.

2. For copper and brass piping. All unions shall be 125-lb brass ground-joint type.

j. Gaskets

1. For fixture outlets to floor flanges. Gaskets shall be soft asbestos with graphite finish conforming to Federal Specification HH-G-116, Type D.

k. Jointing Compounds

1. Threaded and flanged jointing compound shall be made up of pipe cement and oil or graphite and oil.

2. Fixture setting compound shall conform to Federal Specification HH-G-536.

3. Hot poured jointing compound shall be of a type that will not soften sufficiently to destroy the effectiveness of the joint at 160° F nor be soluble in any of the wastes normally carried by the drainage system, and shall conform to Federal Specification SS-C-608.

l. Lead

1. Caulking lead shall conform to Federal Specification QQ-L-156.

2. Sheet lead shall weigh not less than 4-lbs per square foot and shall conform to Federal Specification QQ-L-201.

m. Packing for hub and spigot joints shall be twisted jute conforming to Federal Specification HH-P-117, or hemp conforming to Federal Specification HH-P-106b.

n. Cleanouts shall have bodies that conform in thickness to that required for the pipe with which they are installed.

They shall extend not less than 1/4 inch above the hub if installed with soil pipe. The cleanout plug shall be of heavy brass not less than 1/8 inch thick, and shall be provided with raised nut or recessed socket for removal. Cleanouts shall conform to Federal Specification WW-P-401. Recessed sockets shall be provided for all cleanout plugs in the floor.

o. Nipples shall be the same material as the pipe or tubing with which they are installed. They shall be extra strong when the unthreaded portion is less than 1 inch long. Nipples shall conform to Federal Specification WW-N-351, Type "A".

p. Floor flanges for plumbing fixtures shall be not less than 3/16 inch thick cast-iron or galvanized malleable iron, or not less than 1/8 inch thick brass. Floor flanges shall conform to Federal Specification WW-P-541b.

q. Plumbing fixtures, trimmings and related items, such as sill cocks, supplies, escutcheons, traps, and floor drains shall conform to Federal Specification WW-P-541b.

1. Sill cocks shall be brass with hose end, and wall flange or shoulder shank at exposed connections. Key operated.

r. Pipe covering and insulation

1. Above-ground cold water piping insulation shall be 3/4 inch pre-shrunk wool-felt pipe covering with asphalt-saturated felt liner and cotton sheeting jacket, designed to prevent sweating of the piping. The insulation shall conform to Federal Specification HH-I-567, single layer.

2. Above-ground hot water supply piping insulation shall be 3 ply pre-shrunk asbestos air-cell pipe covering with cotton sheeting jacket, fabricated in corrugated piles, each ply being approximately 1/4 inch thick. The insulation shall conform to Federal Specification HH-I-561c, Type "I".

3. Asbestos cement shall consist of ground asbestos fibre and other fireproof insulating materials which shall be mixed with water to consistency of mortar and applied with a trowel. One tablespoon of blue-stone shall be added to each gallon of asbestos cement mortar. Pipe joints in covered lines shall be covered with asbestos cement the same thickness as the pipe covering and encased in canvas.

s. Caulking ferrules shall be of red-brass pipe conforming to Federal Specification WW-P-351; or of heavy cast red brass or seamless copper of sizes and weights required by local codes or the Uniform Plumbing Code.

t. Soldering nipples and bushings shall be standard red-brass pipe conforming to Federal Specification WW-P-351; or of heavy cast red brass of sizes and weights required by the local code or the Uniform Plumbing Code.

u. Solder shall be composition 95% tin, 5% antimony. Flux shall be the non-corrosive type conforming to Federal Specification Q-F-506.

v. Coal-tar enamel shall conform to American Water Works Association Standard 7A.6.

25-3 EXCAVATION AND BACKFILL:

(1) Trenches for underground piping shall be excavated to required depths with bell holes provided as necessary to insure uniform bearing. Excavation below the required grade of piping shall be refilled with sand or gravel firmly compacted. Where rock is encountered in ditches for water supply and sewer pipes it shall be excavated to a grade 3 inches below the lowermost part of the pipe and refilled to the pipe grade as specified. The trenches shall be sheathed, braced, pumped or bailed as necessary to protect workmen and adjacent structures, and to permit proper execution of the work.

(2) After the piping has been installed, tested and approved, by the Local Authority, the trenches shall be backfilled to grade with approved material well tamped or puddled compactly in place. In backfilling, the earth shall be carefully placed and hand tamped along the sides of the pipe, and for a depth of one foot above the top of the pipe. Bell holes shall be filled and tamped before backfilling trench.

(3) All underground piping shall be installed below the frost line, not less than 18 inches below finished grade.

(4) Where practicable, all service line ditches shall be pitched slightly away from the building.

(5) All piping under floor slabs shall be installed and approved tests made before pouring of slabs.

25-4. DRAINAGE AND VENT LINES:

(1) The drainage and vent piping shown shall be installed as indicated on the drawings; vents shall extend through the roof. Piping shall be assembled and installed without undue strains or stresses and provision shall be made for expansion, contraction, and structural settlement. No structural member shall be weakened or impared by cutting or notching, unless adequate provision is made with the approval of the Local Authority for carrying the structural load.

(2) a. Horizontal drainage piping shall be installed in practical alignment at the grade shown on the drawings, but in no case less than a uniform grade of 1/4 inch per foot for 3 inch pipe and smaller and not less than 1/8 inch per foot for 4 inch pipe.

(3) b. Vents from any fixture or line of fixture, when connected to a vent line serving other fixtures, shall be extended at least 6 inches above the flood level rim of the highest of such fixtures to prevent use of the vent line as a waste. No vent terminal shall be directly beneath any door, window or other ventilating opening of the building or any adjacent building, nor shall any such vent terminal be within 12 feet horizontally of such an opening unless it is at least 3 feet above the top of the opening. Extensions of vent pipes through a roof shall be terminated not less than 2 inches above the roof, unless otherwise indicated on the drawings. Vent stacks need not extend above ridge roof ventilators.

(4) c. Changes in direction in drainage piping shall be made by the appropriate use of 45° wyes, half-wyes, or long sweep quarter, sixth, eighth, or sixteenth bends. Sanitary tees or short quarter bends may be used on vertical stacks or drainage lines where the change in the direction of flow is from the horizontal to the vertical; except that long-turn TYs shall be used when two fixtures are installed back to back and have a common drain. Straight tees, elbows, and crosses may be used on vent lines. No change in direction of flow greater than 90° shall be made. Where different sizes of drainage pipes or pipes and fittings are to be connected, standard increasers and reducers of proper size shall be used. Reduction of the size of drainage piping in the direction of flow is prohibited.

(5) d. Drilling and tapping of house drains, soil, waste or vent pipes, and the use of saddle hubs and bands are prohibited.

(6) e. Protection against breakage of piping passing under or through walls shall be provided by means of pipe sleeves (see Section 7). Piping passing through or under cinders, cinder concrete, or other corrosive material shall be protected with a heavy coat of coal-tar enamel.

(7) f. Cross-connections or any fixtures, devices or construction which will permit backflow connections between a water distribution system and any part of the drainage system shall not be installed.

25-5 JOINTS AND CONNECTIONS:

(1) All piping shall be made permanently gas and watertight. Any fitting or connection which has an enlargement, chamber, or recess with a ledge or shoulder or reduction of the pipe area that offers an obstruction to flow through the pipe shall not be installed.

a. Caulked joints for cast iron soil pipe shall be firmly packed with oakum or hemp, and filled with molten lead not less than 1 inch deep. Lead shall be run in one pouring and caulked tight. No paint, varnish, or other coating shall be permitted on the jointing material, until after the joint has been tested and approved.

b. Threaded joints shall be made with a lubricant on the male thread only. All burrs or cuttings shall be removed and pipe shall be reamed or filed out to not less than the original diameter.

c. Floor connections for water closets shall be made by means of an approved brass or iron flange, caulked, soldered or screwed into the drainage pipe. The connection shall be bolted, with an approved gasket between the fixture base and the connections.

d. Portland cement joints shall not be installed.

e. Soldered or brazed joints made with fittings having preinserted rings of solder or brazing alloy shall have the tube and fitting cleaned bright and fluxed. The joints shall be heated sufficiently to make a tight connection. Tubes and fittings without such rings, shall be cleaned bright, fluxed and heated until the solder is drawn into the joint by capillarity and the connection is tight.

f. Hot poured joints shall be provided between cast-iron soil pipe and vitrified clay or concrete sewer pipe. The joint shall be made by caulking the joint opening with jute or hemp packing and then filling it with an approved hot jointing compound at one pouring.

g. Wiped joints for lead pipe and fittings or between lead piping and brass or copper pipes, ferrules, solder nipples or traps shall be full-wiped joints. Such joints shall have an exposed surface on each side of the joint not less than 3/4 inch wide and at least as thick as the material being jointed. Wall or floor flange wiped joints shall be made by using a lead ring or flange placed behind the joint at the wall or floor. Joints between lead and cast-iron, wrought-iron or steel pipe shall be made by means of wiped joints to the caulking ferrule, soldering nipple, or bushing.

h. Slip joints and unions shall be used only in the waste pipe between a trap seal and a fixture. Unions on the sewer side of the trap shall be ground faced and shall not be concealed or enclosed.

25-6. TRAPS AND CLEANOUTS:

(1) Fixture traps shall be installed on every plumbing fixture except those having integral traps. A combination fixture need have only one trap, if one compartment is not more than 6 inches deeper than the other and the waste outlets are not more than 30 inches apart.

(2) Type of fixture trap shall be water-seal, self-cleaning P or drum trap. P-traps shall be used for lavatories and sinks and drum traps for bath tubs. Trap water seals shall be not less than two inches and not more than 4 inches. Each trap, except integral traps or those that are readily removable, shall have an accessible brass cleanout of ample size, protected by the water seal. Bath tub traps shall be 4 inches by 8-1/2 inches cast iron drum traps with nickel plated brass trimmings. Tops of drum traps shall have countersunk heads and shall be flush with the finished floor.

(3) The nominal size of each fixture trap shall be the same as the fixture drain to which it is connected. The size of the fixture drain for fixtures with integral traps shall not be smaller than the fixture outlet. In any case, the minimum size of the trap and fixture drain shall be not less than the following:

Water closets	4	inches
Bathtub	1-1/2	"
Lavatory	1-1/4	"
Combination sink and laundry tray	1-1/2	"

(4) Cleanouts shall, in general, be installed in easily accessible locations. Provide all cleanouts as indicated on the floor plans and/or riser diagrams and additionally if required by applicable codes. Cleanouts shall be of not less than the size of the piping with which installed, up to 4 inches and not less than 4 inches for larger sized piping. When installed in floor or ground they shall have countersunk heads and be set flush with finished floor or grade. See detail.

25-7. SLEEVES AND ESCUTCHEONS:

(1) Sleeves shall be installed around all piping passing through masonry foundations, walls, slabs, partitions, or other building construction. Sleeves placed horizontally shall be standard weight pipe one size larger than the pipe passing through the sleeve; those placed vertically shall be 26 gauge galvanized sheet steel, flared and nailed to the form. Sleeves passing through exterior walls shall be made watertight with caulking compound.

(2) Escutcheons shall be installed around all exposed pipe passing through a finished floor, wall or ceiling. Escutcheons shall be of sufficient outside diameter to cover the sleeve opening and shall fit snugly around the pipe.

25-8. HANGERS, ANCHORS AND INSERTS:

(1) a. Hangers shall support the piping from the building structure to maintain the required grade and pitch of the pipe lines, prevent vibration, secure the piping in place, and provide for expansion and contraction. Hangers shall be secured to inserts wherever practical, otherwise approved beam clamps or hanger flanges.

b. Hanger spacing

1. Cast-iron soil pipe supports shall be spaced at not more than 5-foot intervals.

2. Steel pipe supports shall be spaced at not more than 12-foot intervals.

3. Copper tubing supports shall be spaced at not more than 6 foot intervals. Supports for copper tubing shall be of copper, brass or copper plated steel.

c. Vertical piping shall be supported at its base by a hanger placed in the horizontal line near the riser, or by a base fitting set on a pedestal or foundation. The piping shall be clamped or secured at alternate floors.

d. Approved bolts and inserts shall be used for connecting hangers, supports, fixtures, or equipment to masonry; wood plugs shall not be used.

25-9. FLASHING:

(1) Pipes extending through the roofs, shall be flashed watertight. Flashings shall be sheet lead extending not less than 8 inches around the pipe and terminated by being turned down into the top of the pipe as a cap, or by caulking into a hub.

(2) Flashing for gas vent stacks shall be of galvanized steel with storm collar and plastic cement. Flashing shall be furnished and installed by the Heating Contractor in accordance with recommendations and standard details of the manufacturer of the vent stack material.

25-10. WATER SUPPLY:

(1) a. Hot and cold water supply systems shall be run as indicated on the drawings, including mains, risers, supplies to fixtures, hose bibs, hydrants, and all indicated equipment. All piping shall be pitched at least 1 inch in 25 feet so that it can be drained completely at the low points. Drain valves or drain plugs shall be installed at low points. Piping shall be pitched up toward risers and fixtures for proper air relief.

(2) Size of fixture supplies shall be as indicated on the drawings, but shall in no case be less than the following:

	Cold Water	Hot Water
Water closet	3/8 inch	-------
Bathtub	1/2 "	1/2 inch
Lavatory	3/8 "	3/8 "
Combination sink and Laundry tray	1/2 "	1/2 "
Hose bib and sill Cock	1/2 "	-------

(3) Capped air chambers not less than 18 inches high and the full diameter of the riser shall be provided at the top of each hot and cold water riser.

(4) Stop valves shall be installed in an accessible location within each dwelling.

(5) Unions shall be installed at the connections to each piece of equipment.

(6) Sill cocks shall be installed approximately 18 inches above grade, flush with the building wall at locations shown on the drawings.

(7) Cross-connections between water supply for drinking or domestic purposes and any polluted supply (such as drainage system piping) are prohibited and shall not be installed. Any plumbing fixture, devices or construction which will permit or make possible any back flow of sewage, polluted water, or wastes into the water supply system is prohibited and shall not be installed.

(8) Insulated unions of steel armored nylon as made by Universal Controls Corporation, 731 West Davis Street, Dallas, Texas, shall be installed between copper water lines and hot water tanks; between copper tubing and underground ferrous water service piping:

25-11. INSULATION:

(1) Hot water supply piping shall be insulated when located in the following spaces:

1. Finish spaces
2. Storage rooms and closets
3. Exterior walls
4. Attic spaces

(2) Cold water piping shall be insulated when located in finisned spaces and attic spaces.

(3) Metal bands securing the pipe covering in place shall be spaced not more than 18 inches on centers and at all fittings.

(4) Fittings of all insulated piping shall be covered with asbestos cement to the same thickness as the adjacent pipe covering and jacketed with cotton sheeting in the same manner.

(5) Chromium plated brass connections to plumbing fixtures, also exposed water piping at shut-off valve under Kitchen sink, shall not be insulated.

25-12. PLUMBING FIXTURES:

(1) The Contractor shall set up at the building site or in other convenient place designated by the said Local Authority, one (1) fixture of each type, completely fitted, of the quality which he proposes to furnish and on which he has received the approval of the Local Authority and Architect. Approved fixture samples shall be kept free of usage and protected at all times for comparison. All fixtures of poorer quality than the samples will be rejected.

(2) Plumbing fixtures shall be of the best quality as fabricated by a manufacturer of established reputation and shall be submitted for the approval of the Local Authority.

(3) All fixtures and trim shall be of the same manufacture.

(4) All fixtures shall have the manufacturer's guaranty, label or trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer's symbol signifying acid resisting material.

(5) Furnish and install all plumbing fixture, complete with all equipment, fittings, trimmings, etc., as shown or specified and as approved.

(6) All exposed metal parts of fixtures shall have chromium plated finish.

(7) All fixtures having hot or cold water shall have the cold water faucet on the right hand side of the fixture and the hot water faucet on the left hand side of fixture.

(8) The Contractor is referred to the Architectural and Mechanical Drawings for the quantities of fixtures to be furnished under this Division of the Specifications which shall be deemed to include all plumbing fixtures shown of the type described hereinafter, complete with all necessary trimmings.

(9) Plate numbers of the following fixtures are those of the American Radiator-Standard Sanitary Manufacturing Company, and are given for the purpose of establishing minimum quality and are not intended to limit competition.

(10) Fixtures and fittings shall conform to WWP-541 A. and B.

(11) Where fixtures are to be hung on the walls not less than 6 toggle bolts shall be provided for each lavatory and combination sink and tray and not less than 3 toggle bolts for each W. C. tank.

a. BATHTUBS

ACID RESISTING enamel cast iron recessed pattern tub with full extended apron, built-in at back and both end walls, with raised bead on built-in portions. Tub to be 5'-0" long, at least 30-3/4" wide, and with overall height of at least 16". To be fitted with 1-1/2" combination cast brass concealed drain and overflow with beaded chain and heavy rubber stopper with lead washer inserts, built-in two valve tub supply fitting with over-rim spout, metal escutcheons and metal indexed handles. Faucets to be provided with renewable threaded, RE-NU barrell or sleeve to receive the valve stem. Tub drain and overflow to have lead washers, no gaskets will be permitted. Tub to be Standard Plate P-2225 or P-2227, with R-1500 and R-1710 as required. A bed of cement grout approximately 4 inches in diameter shall be provided under each rear corner of the tub bottom to provide permanent support. Wood wedges alone under the tub will not be enough.

b. LAVATORIES (GENERAL)

ACID RESISTING enameled cast iron 20x18" wall hanging lavatory, 6" integral back, wall hanger, integral apron and basin approximately 16x9-1/2" to be fitted with 3/8" I.P.S. angle supplies and escutcheons without stops, combination RE-NU fitting with spout raised at least 1/2" above high point of slab; heavy brass chain stay; with chain and rubber stopper with metal inserts; P.O. plug 1-1/4" tailpiece; cast brass P trap with cleanout and metal wall flanges. Lavatories to be Standard Plate P-3869-31, aerator on spout.

c. CLOSETS

Vitreous china round front reverse trap closet bowl with jet and 2" back inlet with vitreous china 6 gallon capacity shelf top low tank, flushing fittings, single action metal lever, supply pipe to wall without stop and 2" elbow flush connection. Air gap shall be provided on the supply valve in the tank to prevent back syphonage. Water closets shall be fitted with seat and cover as hereinafter specified. Closet overall clearance dimensions from wall to front of bowl shall not exceed 2'3". Closet to be Standard Plate F-2180 with R-3020 ball cock and IPS supplies, china caps.

Water closet seats and covers shall be smooth, polished white finish, closed front to conform to rim of bowl. To be Mol-Tex composition with solid core and impervious to moisture or acid solutions - shall be equipped with heavy chrome plated cast brass leaf hinge or other approved hinge. The hinge to be attached by not less than 6 screws to seat. Seats shall be equipped with 2 elongated bumpers at front to form a proper cushion contact between the seat and rim of bowl. Covers shall have 3 elongated rubber bumpers on bottom. Seat and cover to be Church Mol-Tex #900. Closet seats in the M and M Building shall be without covers.

d. SINK AND TRAY COMBINATIONS

ACID RESISTING enameled cast iron sink and laundry tray combination, supported on concealed wall brackets and one painted adjustable cast iron leg. Fixtures to be 42" long and 25" wide with integral back not-less than 4" high and with roll rim. Fixtures to be enameled inside and overrim and painted outside. To have combination swinging spout faucet with RE-NU units with soap dish, aerator, installed over center of dividing partition. Sink to have brass strainer with flat perforated grid 3-1/2" in diameter and 1-1/2" tailpiece. Tray to have brass plug with rubber stopper and 1-1/2" tailpiece. To be complete with one 1-1/2" cast brass P trap with cleanout plug, 1-1/2" continuous waste, in accordance with Local Plumbing Code. To have reversible drainboard designed to fit over either sink or tray compartment. All exposed metal trim to be chromium plated. Sink and, tray combination to be Standard Plate P-7424-23 or P-7425-23 as required, complete as described above, R-4011 faucet, P-7450 drainboard, P-7448-B leg, R-45000 strainer, R-4530 strainer.

25-13. PROTECTION DURING CONSTRUCTION

(1) Plumbing fixtures and trim shall be protected against damage or injury due to building materials, acid, tools, equipment, or any causes incidental to construction. The finished surface of each fixture shall be covered with building paper or similar protection and the fixture encased in a wood box or crate. Chromium plated surfaces shall be covered with vaseline to protect their polish. All fixtures damaged by any cause, and any trim with marred or scratched finish, shall be replaced at no cost to the local Authority. The fixture protection shall be removed at the completion of construction.

(2) All pipe openings shall be closed with wood plugs or caps during construction. The plugs or caps shall be installed when the pipe is roughed in and shall not be removed until final connection is made.

25-14. CLEANING UP

(1) All piping, hangers, fixtures and trimmings and all equipment shall be thoroughly cleaned and in perfect condition ready for use. All parts of the plumbing system and all equipment shall be adjusted and put in perfect operating condition.

25-15. TESTS

(1) The Contractor shall notify the local Authority and the administrative Authority having jurisdiction over plumbing work three working days before the tests are to be made. Concealed work shall remain uncovered until required tests have been completed, but if necessary, tests on portions of the work may be made and those portions of the work may be concealed after being proved satisfactory. All tests shall be made in the presence of the representatives of the local Authority. Repairs of defects that are discovered as a result of inspections or tests shall be made with new materials. Caulking of screwed joints, cracks, or holes will not be accepted. Tests shall be repeated after defects have been eliminated.

a. Drainage system tests.

1. A water test shall be applied to all parts of the drainage systems, before the pipes are concealed or fixtures set in place. The test may be applied in sections. All openings of each system to be tested shall be tightly closed except the highest opening above the roof, and the entire system shall be filled with water up to the overflow point of this highest opening. All parts of the system shall be subject to not less than 10 feet of hydrostatic head except the uppermost 10 feet of the piping directly below the opening. The water shall remain in the system for not less than 15 minutes after which time no leaks at any joint or lowering of the water level at the over-flow shall be visible.

2. A peppermint test shall be applied to all parts of the drainage systems after all fixtures have been permanently connected and all traps filled with water. A mixture of two ounces of oil of peppermint and one gallon of hot water shall be poured into each roof opening of each system and these openings shall then be tightly closed. There shall be no odor of peppermint within the building or at any joint, connection or fixture opening as a result of the peppermint mixture having been introduced into the system. Operators who pour the peppermint mixture shall not enter the building to do the testing.

b. Water supply system tests

1. A water pressure test shall be applied to all parts of the water supply systems before the piping is concealed or before the fixtures are connected. A hydrostatic pressure of not less than 100 pounds per square inch shall be applied to the system, and there shall be no leaks at any point in the system at this pressure.

c. Gas piping system tests shall be made in accordance with the rules and regulations of the utility serving the project. However, if no such rules exist or if the test pressure to be used is less than 10 pounds per square inch, the entire gas piping system shall be tested as follows: Air shall be pumped into the system until the pressure reaches 10 pounds per square inch or 20 inches of mercury above atmospheric pressure as read on a mercury column gauge. This pressure shall remain constant for not less than 15 minutes with no further pumping of air into the system.

25-16. DOMESTIC WATER HEATING:

(1) Individual gas fired water heaters combined with individual storage tanks of specified size and construction shall be the automatically controlled type, arranged for venting, in which a vertical hot water storage tank and gas burner are combined in one unit and encased in a metal jacket. The unit shall be listed by the American Gas Association and shall bear the A.G.A. label. The unit shall be provided with a draft hood, thermostat, gas valve, pilot light, fixed orifices and all necessary automatic controls, so that during normal operation the main burner will ignite and operate wherever the water temperature drops below the thermostat setting, and heating will automatically cease wherever the water temperature rises to the thermostat setting. The gas valve and pilot shall be provided with means for manual shut-off. The thermostat shall be a fixed or adjustable locking type operating between 130° and 140° F. The pilot shall shut off the gas supply to the main burner upon flame failure. The insulation shall be not less than 1 inch thick. Tanks shall be of porcelain enamel lined (glass lined) steel which shall be constructed and finished in accordance with Commercial Standard C.S. 115-44, Porcelain Enamel Tanks for Domestic Use, issued by the National Bureau of Standards. A magnesium anode shall be provided in each tank.

(2) Tanks for individual water heaters shall have a nominal capacity of 20 gallons for one-bedroom dwellings, 30 gallons for two or three bedroom dwellings and 40 gallons for four or five bedroom dwellings. The tanks shall be designed for 127-1/2- lbs. per square inch working pressure and shall have been tested to 300 pounds per square inch hydrostatic pressure without visible change of shape or distortion. The tank shall be insulated with the specified thickness of mineral wool, or equivalent insulation, applied around the tank and encased in a hard finish jacket. Tappings shall be 3/4 inch I.P.S. minimum. The tank shall have a drain valve at its lowest point.

(3) The AGA input of automatic gas water heaters shall be not less than the following:

1. For a water heater with a 20 gallon tank 20,000 BTU/hr.
2. For a water heater with a 30 gallon tank 24,000 BTU/hr.
3. For a water heater with a 40 gallon tank 30,000 BTU/hr.

(4) The manufacturers written guarantee shall be furnished by the Contractor with each heater. This guarantee shall cover the tank for a period of ten years, the first five years unconditionally, the second five years prorata. During the sixth year following original installation, the cost to the Local Housing Authority will not be more than 50 percent of the manufacturer's then current price of the heater being replaced, (that is the manufacturer's price to the dealer and not the dealer's price to the retail trade); during the seventh year, not more than 60 percent; during the eighth year, not more than 70 percent; during the ninth year, not more than 80 percent and during the tenth year, not more than 90 percent. The controls shall carry a one year unconditional guarantee. All replacements guaranteed are to be made on a basis of F.O.B. Athens, Georgia. The guarantees shall be in printed form and turned over to the Local Housing Authority upon completion and acceptance of the work. The name and address of the Agent who will furnish service under the guarantees shall be submitted to the Local Housing Authority.

(5) A pressure and temperature relief valve, 3/4 inch resetting type such as Watts A44XL, or equal, and listed by A.G.A. shall be furnished and installed at the highest portion of each water heater tank, and there shall be no check valves or shut-off valves of any kind between the tank and relief valve. A discharge connection of copper tubing shall be run from each relief valve to the floor.

25-17. GAS CIRCULATORS FOR SPACE HEATING:

(1) Furnish and install gas circulators for space heating.

(2) Heaters shall be of the vented circulator type, designed for using natural gas, having 1060 B.T.U. content.

(3) Each gas circulator, as a completely assembled unit shall have the current listing of the American Gas Association and shall bear its label. Rating shall be on the basis of input and shall be not less than the amount shown on the plans, nor more than 20% above indicated ratings provided the flue collar size conforms to the requirements of Section (10) below.

(4) Circulators shall be of current stock design, manufactured by a concern regularly engaged in gas circulating heater design and production.

(5) Circulators shall be in accordance with the latest and prevailing requirements for gas circulators, as set forth by the American Gas Association and listed in the current directory of Approved Gas appliances published by the American Gas Association Laboratories, and bear their labels, and in addition shall comply with the requirements of this specification.

(6) Heaters shall be equipped with 100% full automatic control of self-contained type designed to automatically cut off supply of gas to main burner and pilot burner upon flame failure, and to remain off until pilot is relighted.

(7) Heaters shall be equipped with automatic room temperature control device which may be adjusted to desired temperature by occupant. This control shall be self-energizing and may be so constructed as to function as both safety pilot and temperature control device, of the snap action type.

(8) Heaters shall be of the enclosed flame type. The combustion chamber and heat exchanger shall be finished in high temperature porcelain enamel inside and outside conforming with National Bureau of Standards high temperature ceramic A-19.

(9) Heaters shall be of the console type, except that recessed heaters shall be provided in the halls of "B" type buildings where shown on plans.

(10) Flue collar sizes on space heaters offered shall be within the following limits:

30,000 B.T.U. to 50,000 B.T.U.; not over four inches in diameter.
51,000 B.T.U. to 65,000 B.T.U.; not over five inches in diameter.
66,000 B.T.U. to 80,000 B.T.U.; not over six inches in diameter.

(11) Heaters shall be designed so that thermostat and gas connections may be located on either right or left side and operated from either right or left side:

Where console heaters are located in a corner the end of the heater shall be not less than six inches from the side wall and the gas connections and controls shall be on the end of the heater farthest from the side wall. The recessed heaters shall be designed so that it may be lighted from the front.

(12) All circulators shall be rigidly constructed from metal sheets of not less than 20 gauge thickness.

(13) The outside casing shall have a porcelain or baked finish. It shall be provided with openings for air circulation, supply openings shall be in the form of grilles, louvers, or a combination of both. Casing shall be constructed and equipped with suitable means to permit easy access to burner, pilot burner and inside of combustion chamber for servicing purposes.

(14) The draft diverter shall be of the built-in type of not lighter than 20 gauge metal and shall be entirely enclosed within heater casing to permit placing of heater close to wall.

(15) Furnish with each circulator, for use of tenants, descriptive literature giving simple instructions as to operation and maintenance.

25-18. GAS SYSTEM:

(1) Service entrance installations of gas piping shall be designed to prevent gas seepage into the buildings. A sleeve and pipe guide shall be installed where the piping passes through the building wall and both ends of the sleeve opening shall be caulked with caulking compound.

(2) Insulating unions of steel armored nylon as made by Universal Controls Corp., 731 West Davis Street, Dallas, Texas, shall be provided in the gas piping at each service entrance.

(3) Where gas pipes enter buildings above finish grade provide pipe sleeves as for cold water services. Gas piping shall not be run in cavities or wall spaces but shall always be exposed to permit complete ventilation.

(4) Gas ranges will be furnished by the Housing Authority and delivered to the Plumbing and Heating Contractor at the transportation terminal serving the project. This Contractor shall transport the ranges to the buildings and uncrate them. This Contractor shall place all gas equipment, including ranges, water heaters and space heaters in final position and connect up to the gas piping. A shut-off cock, wing lock or ground key type, shall be installed in the gas line at each piece of gas equipment. Between each shut-off cock and the equipment, a union, or nipple and coupling, shall be installed to permit disconnection of the gas appliance. Water heaters and space heaters shall be connected also to the gas vent piping.

25-19. GAS VENT STACKS:

(1) Gas vent stacks similar to Metalbestos or Durovent shall be furnished and installed and connected to the back draft diverters on the space heaters, and water heaters.

(2) The gas vent stacks shall be constructed of incombustible material of sufficient thickness, cross-sectional area and heat insulating quality to avoid temperatures in excess of 165 degrees Fahrenheit, on adjacent materials when located inside partitions, walls, or extending through combustible walls, floors, ceilings, or roof. They shall consist of inner and outer tubes forming a 1/2" air insulating space. The inner tube shall be of aluminum not less than .012" thick and the outer tube not less than #26 USS gauge galvanized steel. Each section of metal stack shall carry the Underwriter's label.

(3) All vent stacks shall be securely fastened to adjoining structure with perforated iron supports at each joint or fitting and there shall be at least 1" clearance between the stacks and any combustible material.

(4) Each gas vent stack shall be terminated above the roof with a ventilator top of the same material as the pipe, as shown on the drawings.

(5) The Contractor shall submit to the Architect for approval shop drawings of all vent stack installations. Their fittings and connections with flashing connections and ventilators, before installing same. All vent stacks shall be in accordance with the regulations of the National Board of Fire Underwriters.

25-20. CONNECTIONS FROM CIRCULATORS AND WATER HEATERS TO VENT STACKS:

(1) A vent connection of No. 18 U.S. gauge galvanized steel shall be furnished and installed from the back draft diverters on the circulators and water heaters to the gas vent stacks. All connections shall be made gas tight and not any longer than necessary.

25-21. FORCED WARM AIR HEATING SYSTEMS: (M and M BUILDING).

(1) Furnace

a. Furnace and blower-motor units shall be enclosed in a baked enamel steel casing not lighter than No. 22 U.S. Standard gauge. Casings shall have smooth or wrinkle finish and shall be rigidly secured from the inside. The portion of the casing enclosing the furnace shall be equipped with a galvanized or black steel liner not lighter than No. 26 U.S. Standard gauge. The liner shall be secured to the casing to provide not less than one inch clearance between casing and liner permitting positive air flow therein. In lieu of an inner liner, an approved insulating material may be provided.

b. Each furnace shall be mounted on an adequately supported steel frame independent of the blower-motor unit. The entire assembly shall rest on legs not less than 5 inches high, to admit air under the filter.

c. Each blower-motor unit shall be mounted on a single base set on a sound-absorbing foundation pad or ceiling mounting. The blower shall be a standard catalog product of a reputable manufacturer, and the capacity shall be not less than that shown on the drawings. The blower shall be constructed and rated in accordance with the standards of the National Association of Fan Manufacturers and the Standard Test Code for Centrifugal and Axial Fans of the American Society of Heating and Ventilating Engineers.

d. All electric parts including electric controls and electric motors shall meet the safety requirements of the Underwriters' Laboratories, Inc., for such equipment. Fan motors shall be of a type suitable for this use, and be commercially accepted as being free from objectionable radio interference. Motor shall be constant speed with adjustable pulley, arranged for connection to blower with an approved "V" belt drive. Motor shall be in accordance with A.I.E.E. and N.E.M.A. Standards, selected for quiet operation and shall be of sufficient capacity to operate the blower at its rated capacity without undue heating and sparking Provide thermal overload protection of the automatic reset type. Motor shall be suitable for 115 volts, 1 phase, 60 cycle operation.

e. Filters shall be included as an integral part of each furnace and shall be of the replaceable type, arranged and located for easy removal through access door in the furnace casing. Filters shall be located so that no point on the filter will reach a temperature in excess of 90° F. above room temperature when the furnace is operating at maximum output, regardless of the operation of the forced air equipment. Average velocity through the filter shall not exceed 300 F.P.M. based on the nominal, external dimensions of the filter.

f. Air temperature controls shall consist of a high limit control, blower control and room thermostat. Controls shall have the current listing of the Underwriters' Laboratories, Inc., and be so labeled. In the event of electric power failure the controls shall restrict the firing rate as accomplished by the normal operation of the room thermostat. All necessary relays, starters, transformers, etc., that are required for proper operation shall be furnished and installed. Wiring connections and material shall be furnished and installed under the Division "Interior Wiring".

1. An insertion type bonnet thermostat, designed and arranged to operate the blower "on and off" when the bonnet temperature is above or below the predetermined setting, shall control the blower. The setting shall be adjustable over a scale

range of approximately 90 to 180° F., with an adjustable differential of approximately 25° F. Change in temperature setting shall be made by means of a removable key or socket wrench furnished with each furnace. The bonnet thermostat shall have a high limit control which shall not permit the delivery of air heated above 250° F. The high limit control may be furnished as an integral part of the bonnet thermostat, or as a separate unit.

2. The room thermostat shall be designed and arranged to close and open the automatic gas valve when the room temperature is above or below the predetermined setting. Thermostat shall be equipped with a thermometer, having a scale range of 55 to 85° F. and shall operate on a differential of 2° F. Gas valve shall be diaphragm type.

3. Additional safety controls as required by Pamphlet No. 90, issued by the National Board of Fire Underwriters shall be furnished with each furnace. Safety pilot control shall be provided to close the automatic gas valve on flame failure.

g. Gas Fired furnace shall conform to the latest approved requirements of "Central Heating Gas Appliances", as sponsored by the American Gas Association and approved by the American Standards Association, and shall bear the AGA label. Blower-motor unit shall be set under or adjacent to the furnace and integral therewith. Gas controls shall be installed complete on the furnace at the factory.

h. Forced air furnaces shall have an output capacity at the bonnet of not less than that shown on the plans. Capacity shall be based on use of natural gas with a heating value of 1080 BTU/cu.ft. and a specific gravity of 0.60.

i. Heat exchangers shall be constructed of cast-iron or steel. If of steel, the heat exchanger shall be not lighter than #12 U.S. Standard gauge, and cast-iron shall be not less than equivalent thickness. The heat exchanger shall have a high efficiency of heat transfer between the products of combustion and the circulated air for heating and shall be sized to deliver the heat output specified. The gas passage shall be designed to minimize air friction. All seams shall be welded and the exchanger shall be so constructed that the air for heating will not be contaminated by the products of combustion.

(2) . Vent Connection

A vent connection from each forced warm air furnace shall be extended to the vertical masonry flue. Vent connection shall be No. 16 U.S. gauge galvanized steel.

(3) Ductwork

a. Furnish and install all sheet metal work in connection with the forced warm air heating system, including ductwork and connections to furnaces.

b. Sheet metal ducts shall be provided and installed as shown on the drawings. All details of the ductwork are not indicated and the necessary bends, offsets and transformations must be furnished whether shown or not.

c. All ductwork shall be fabricated from the best bloom galvanized steel and shall be of the following gauges:

0" to 12"	greatest dimension	#26 U. S. Gauge
13" to 30"	" "	#24 U. S. Gauge
31" to 60"	" "	#22 U. S. Gauge

d. All plane panels of ducts over twelve inches (12") wide shall be cross-broken. Each sheet bundle shall be factory labeled with trade name and gauge of metal.

e. All ductwork must present a smooth interior and joints shall be tight. No turns shall be made with an inside radius of less than the width of the duct unless otherwise shown or necessitated by unavoidable space conditions. Should any turns be necessary with an inside radius less than three-fourths (3/4) the depth of the duct, they must be fitted with multiple vanes. No transformations or offsets shall be made with a slope greater than one to seven (1 - 7), space conditions permitting.

f. Supply duct connections from the forced air furnace shall be made with a woven asbestos collar not less than two inches (2") long, secured by peripheral straps holding the asbestos in formed channels. Asbestos shall be Jonns-Manville Style No. MP-3010, or approved equal. Straps and channels shall be galvanized iron.

g. Ducts shall be constructed with drive slip joints as detailed.

h. Horizontal ducts shall be hung at intervals not exceeding eight feet (8') by one-eighth inch by one inch (1/8" x 1") straps rivited to the sides of the ducts and attached to the structure.

i. Dampers and splitters shall be furnished and installed wherever necessary for the proper regulation of the systems. All dampers shall be so located as to be adjustable after the building is completed. A quadrant and set screw shall be installed in connection with all dampers and splitters. Approved bearings shall be provided at damper ends.

j. A damper deflector similar to Tuttle & Bailey "Santrol" or Barber-Colman Volocitrol shall be installed behind each supply grille.

k. All sheet metal work must be tight and shall be caulked if necessary to accomplish this object.

(4) Grilles

a. Grilles shall be of the sizes noted on the drawings or of equivalent areas.

b. All grilles shall be installed with a continuous felt or rubber gasket cemented to the back face.

c. Supply air grilles shall be double deflection type, Tuttle & Bailey T-64, or equal Titus or Stewart, finished in prime coat.

25-22 PAINTING

(1) Painting other than that specified above will be done under another division of the specification.

DIVISION 26

INTERIOR ELECTRICAL WIRING

Attention is called to the "Supplementary Conditions for Mechanical and Electrical Divisions".

26-1. SCOPE:

(1) Furnish all necessary materials, tools and labor and install in each project building a complete and fully operable interior wiring system as indicated on the plans and hereinafter specified. All outlets and fixtures shall be fully connected to sources of current supply and be left ready for use. All materials employed in the construction must be new.

(2) The exterior electrical distribution system supplying service to the various project buildings will be provided under a separate division of the contract, or otherwise as may be stated. The work under this division of the contract shall begin with the service entrance conductors attached to buildings.

(3) c. Install and connect electrically operated equipment as hereinafter specified.

26-2. SYSTEMS:

(1) Secondary electric service to all buildings will be single phase, 3-wire, 115/230 volts, with grounded neutral. From the points of incoming service extend wiring and make connections to circuit protective devices, fixtures and outlets.

26-3. GENERAL REQUIREMENTS:

(1) The Contractor's attention is called to the General Scope of the Base Contract, the General Conditions, the Special Conditions, and Supplementary Conditions which shall govern the installation of his work. The Contractor shall also refer to the site and architectural plans.

(2) All electrical installations shall be made in accordance with the latest edition of the National Electrical Code and its supplements in force at the time of bid opening, and all materials employed shall be Underwriters' listed and approved and bear the Underwriters' official labels where such labeling is customary. In the event that local codes are more rigid than the National Code, both codes shall then be considered as jointly governing and the requirements of either and both then prevail. The Contractor shall be responsible for the proper selection and application of materials and the methods of their installation.

(3) It will be noted that the plans are generally diagrammatic and the actual final locations of wiring extensions and outlets are subject to building and structural conditions; therefore, the Contractor should familiarize himself with other trades engaged in the general construction. The Authority reserves the right to make minor changes in outlet locations at any time prior to roughing-in of the electrical work without incurring any additional costs.

(4). In the event that certain conflicts between the plans and specifications and the governing codes are found to exist, the most rigid requirements shall govern. The Contractor shall not be held responsible for matters of design, and if for any reason it is found that installation cannot properly be made as specified, the Architect or other authorized representative of the Contracting Authority shall be notified with a request for specific instructions as to that procedure to be followed.

(5). Particular attention is called to the provisions of the General Conditions dealing with Changes in the Work. Also, with respect to obtaining necessary permits, inspections and certificates, etc. Minor changes which involve no changes in costs, may at times, be authorized under so-called "Modification" procedure; otherwise, certain changes ordered and approved shall be subject to equitable adjustment of the contract price, in which case all debit or credit data shall be computed on the basis of actual costs rather than on manufacturers' or distributors' list prices subject to trade discount.

(6). . In the event that the Contractor performs work contrary to the established requirements, codes, regulations, etc., and without notice to the Contracting Authority's authorized representative, he shall bear all expense arising therefrom in connection with necessary corrective measures.

(7) The plans and specifications, supplemented by the codes, shall be considered as jointly governing the installations. Any work or materials indicated in either plans or specifications and not indicated in the other shall be considered as being required by both. Likewise, any work obviously necessary to create the required systems, or which may be fairly implied, shall be performed.

(8) Installations of electrical work shall, at all times, be under the supervision of competent mechanics or a foreman fully conversant with methods of good workmanship and practice. Details of installation and connection shall be performed so as to produce a first class finisned product. Following completion, a certificate of approval shall be secured from the local code enforcement authority and delivered to the Contracting Authority.

26-4. TYPES OF WIRING

(1) The types and grades of materials to be employed in the wiring systems are subject to building structural conditions and the governing codes. The Contractor is permitted to employ any of the devices and materials listed in the following Section 5 under conditions permitted by code regulations and good workmanship, with certain exceptions herein and following stated.

(2) b. Unless particularly stated otherwise, all wiring shall be run concealed and outlets shall be flush-mounted in walls and ceilings.

(3) All conduits installed underground, in concrete slabs, on outside of buildings, or where subject to moisture conditions, shall be of the rigid steel zinc-coated type and grade.

(4) Wiring systems, with outlet devices and boxes, shall be grounded as required by the governing codes.

(5) All wiring shall be installed in metal raceways when and where so indicated on the plans or particularly specified.

26-5. MATERIALS:

(1) Certain basic materials and devices required in the wiring systems shall be of type and grade in accordance with the stated Federal Specifications or Underwriters' approved standards as particularly applicable and following mentioned. In the event that any Federal Specification or Underwriters' standard is revised, supplemented, modified, etc., the latest requirements shall then govern. Cheap, inferior substitutes will not be acceptable.

(2) The Contractor shall submit a list of materials proposed to be used in the construction or provide samples, etc., fully establishing the type, grade and quality of each device or item of material. The Contractor shall be responsible for installing only such devices and materials as obviously meet governing requirements.

(3) The following -listed items of materials and devices shall be employed in the construction, subject to their suitability, the regulations of the governing codes, building structural conditions, and the particular requirements of the plans and specifications.

A. Raceways, Fittings and Outlet Boxes

(a) Rigid steel conduits, zinc coated
Federal Spec. WW-C-581-b

(b) Electrical metallic tubing
Federal Spec. WW-T-806-b

(c) Flexible metal conduits, single strip, zinc coated
Federal Spec. WW-C-566

(d) Fittings, zinc coated steel
Federal Spec. WF-406

(e) Outlet boxes and covers, zinc coated
Federal Spec. WO-821a

(f) Outlet boxes and covers, cadmium plated (for outdoor duty) Underwriters' approved

B. Wires and Cables

(a) Building wires, rubber insulated, Types R, RW, RH, and RH-RW.
Federal Spec. J-C-103

(b) Building wires, thermoplastic insulated, Types T and TW
Federal Spec. J-C-129

(c) Non-metallic sheathed cables R, insulated, Types NM and NMC, Underwriters' approved

(d) Armored bushed cables, Type R or T insulated
Federal Spec. J-C-71a

(e) Cord, all rubber, Type S, heavy duty grade, Underwriters' approved

(f) Fixture wires
Underwriters' approved

(g) Cables, service entrance Type SE
Underwriters' approved.

C. Wiring Devices

(a) Receptacles, duplex type, double contacts, 15 amperes, 125 volts, convenience type similar to and equal of Hubbell No. 9595
Federal Spec. W-R-151a

(b) Receptacles, duplex type, 15 ampere, 2-wire, 125 volts, with appliance ground contacts, similar to and equal of Hubbell No. 5262,
Federal Spec. W-R-151a, Type 130, Style II

(c) Switches, wall tumbler type, "T" rated, 10 amperes, 125 volts, similar to and equal of Hubbell Nos. 1815-D and 1835-D.
Federal Spec. W-S-896

(d) Switches, tumbler type, Interchangeable Line devices, for fixtures only
Federal Spec. W-S-893

(e) Finishing plates for wall switches and con venience outlets, of bakelite
Underwriters' approved.

(f) Switches, service Type S
Underwriters' approved.

D. Service Equipment

(a) Switches, fused safety type, pullout type, etc.
Underwriters' approved

(b) Circuit panels, fused type
Federal Spec. W-P-146

(c) Fuses, cartridge type, 250-volt
Federal Spec. W-F-791

(d) Fuses, plug type, 125-volt, with adapters Type "S" Underwriters' approved.

E. Insulating Tapes

(a) Friction tape
Federal Spec. HH-T-101a

(b) Rubber tape
Federal Spec. HH-T-111a

(c) Plastic tapes
Underwriters' approved

F. Lamps, Incandescent Type

(a) General service lamps, 115 - 120 volt
Federal Spec. W-L-101e.

26-6. CABINETS

(1) Cabinets shall be constructed of sheet steel, of code gauge, and for either surface or flush mounting as specified or otherwise justified for job conditions. Surfaces shall be bonderized or otherwise treated to resist corrosion or rusting.

(2) Cabinets for interior installation shall be flush-mounted and have a standard finish of baked enamel on door and trims.

(3) Cabinets mounted outdoors shall be of weatherproof construction with a finish to adequately protect the metal against action of the elements. Provide means of locking covers or doors over the circuit protective sections and furnish a pin type tumbler lock or padlock arranged for master keying of each assembly.

26-7. DISTRIBUTION FEEDER AND CIRCUIT PANELS:

(1) Each panel shall have the necessary number of circuit protective devices as required to properly protect the wiring conductors, with capacities of protective devices coordinated with the circuits. Furnish a typewritten directory at each panel, located on the inside of the panel door.

26-8. METERING OF DWELLING SERVICES:

(1) Retail electric service to each dwelling and project building will be supplied by the local electric utility company under conventional retail procedure and meter sockets or bases will be supplied by the local electric utility company for installation by the Contractor for interior wiring who shall install such equipment as particularly required by the utility company. Arrangements are to be made to individually meter the services of all dwelling units or project buildings with meters supplied and installed by the company.

(2) The local utility company will install service drops to buildings, attach them to the supports installed by the Contractor and make final connections between drops and building service entrance conductors.

26-9. BUILDING SERVING CONNECTIONS:

(1) Overhead Supply: Electrical system covered by this division of the specification shall commence at overhead point of service contact on exterior of building. From this point of contact, extend wiring to meter cabinet and service equipment and then to outlets. At service contact, leave slack cable or conductors for connecting service loop.

(2) Building service mast, pipe mounting insulators, conduit entrance head and roof flashing shall be supplied and installed by the Contractor for interior wiring. Provide fully adequate anchorages to sustain the pulls of all service drops or cables attached to buildings. See detail sheet 5 of the electrical drawings.

26-10. INSTALLATION OF SERVICE ENTRANCE EQUIPMENT AND METERING FACILITIES:

(1) Install service entrance conductors and main service entrance equipment and ground as required by Article 250 of the N.E. Code.

26-11. DISTRIBUTION, FEEDER AND BRANCH CIRCUIT PANELS:

(1) Furnish and install all panels.

(2) Panels in Dwelling Units shall be equal to Walker Electric Co. No. E-104-F or E-106-F, flush design with door and latch and with four or six branch circuits as indicated on the panels. Panels shall have 60 ampere, 115/230 volt mains with lugs, 115 volt branches with single plug fuses and solid neutral.

(3) Panel in the M & M Building shall be equal to Walker Electric Co. No. 2405 N-20 mounted in box No. B-240 with front cover No. FL-240 and shall be designed for flush mounting. The panel shall be equipped with hinged door and latch. Panel shall contain 100 ampere, 115/230 volt mains with 100 ampere main switch and 20 single plug fuses for 115 volt branch circuits.

(4) Service entrance panels for all buildings shall consist of 60 ampere, 3-pole, solid neutral 115/230 volt pull-out main switches equal to Walker Electric Company No. W-4016S with weatherproof box and hinged cover with sealing lugs.

(5) Shop drawings of all panels shall be submitted to the local Authority for approval prior to ordering panels.

26-12. INSTALLATION OF RACEWAYS:

(1) Conceal raceways from view. In non-fireproof roof construction, run raceways parallel to and between joists wherever practical. In crossing joists, notch underside within 2 feet of either bearing; upper side of joists may be notched, provided 10-gauge steel plate is installed over raceways to prevent penetration of flooring nails. No horizontal runs will be permitted in interior partitions.

(2) In structural slabs, run raceways at least 1-1/2" below top and above reinforcing steel.

(3) Keep raceways clear of partitions at ends of bathtubs permitting of future cutting of partitions to remove tub witnout disturbing electrical systems.

(4) Raceway systems shall be capped during course of construction. Clean inside of raceways before installing conductors.

(5) All treaded slip joints shall be made up tignt. Wherever threads are left exposed or where protective coating have been removed in handling, such places shall be painted with one coat of lead and oil of color to match raceway finish.

(6) Face of concrete block shall not be cut to facilitate installation of raceways.

26-13. INSTALLATION OF OUTLET BOXES, COVERS AND PLATES:

(1) Outlet boxes shall be of size and type to properly accommodate the size and number of raceways entering boxes and the wiring conductors therein. Boxes shall also be selected to suit the particular devices to be installed at outlets.

(2) Mount all boxes so that covers and plates will finish flush with wall or ceiling finish surfaces. Furnish and install plaster rings when so necessary. In lighting fixture outlet boxes, install 3/8" fixture studs when the particular fixtures to be employed will require the use of such studs.

(3) Properly center outlets in paneling or other architectural features and clear trims and corners by 4". Switch boxes are to be located adjacent to door openings (strike sides), unless particularly shown otherwise.

(4) The heights of wall outlets above finished floor shall be as follows:

1.	Switches	4' -0"
2.	Receptacles	1' -0", except in kitchens
3.	Bathroom	Above medicine cabinets
4.	Refrigerator Receptacle	1'-6"

(5) If the Contractor elects to employ wiring devices without plaster ears, care must be taken when "pulling" wiring devices up for alignment on finishing plates.

26-14. INSTALLATION OF ARMORED CABLE AND NON-METALLIC SHEATHED CABLE:

(1) Conceal wiring from view. In non-fireproof roof construction, run parallel to and between joists wherever practical. Cutting of vertical studs is not permitted in outside walls. Interior partition studs may be drilled, cut or notched where absolutly necessary and then only to a minimum.

(2) Face of concrete block shall not be cut to facilitate installation of cable.

(3) Keep wiring clear of partitions at ends of bathtubs, permitting of future cutting of partitions to remove tub without disturbing electrical systems.

26-15. INSTALLATION OF WIRES AND CABLES:

(1) . In moist locations or where raceways must be trapped, use moisture-resisting grade of wires (Type RW). Armored cables shall not be embedded in masonry unless with lead covering.

(2) Eliminate splicing of conductors wherever possible. Where necessary, make all splices in readily accessible outlets or junction boxes or outlet fittings of conventional types.

(3) Make taps and splices in wire of size No. 6 or larger by means of brass or copper pressure type connectors applied after conductors are properly cleaned; then make tight and fully insulate the joint by means such as following state in the care of smaller wires.

(4) Make taps and splices in wire No. 8 and smaller mechanically tight by using "Western Union" or pigtail splice, properly cleaned, soldered and insulated with rubber and friction tapes, flashover or insulation valve of joints being at least 100% in excess of wire insulation. Mechanical wire splicers and joints, except those using set screws bearing directly on conductor, may be used.

(5) Branch feeders to dwelling unit circuit panels shall be of size not less than No. 8 wire when serving three or more branch circuits.

(6) All branch circuits in dwellings serving receptacle outlets in kitchen and dining areas shall be of wire size No. 12. Other branches for general lighting and appliance outlets may be of minimum size No. 14.

26-16. WIRING CONNECTIONS - GENERAL:

(1) Provide the required number and capacity of branch feeders and branch circuits in each building and dwelling. Allow two branch circuits for receptacle outlets in each kitchen and dining area. Provide additional branch circuits for general lighting as indicated on drawings.

(2) Balance loads on all 3-wire, 115/230-volt services. This can usually be done by reversing the lines at each second dwelling panel. Three-wire circuits shall have potential difference between conductors, otherwise, two-wire circuits shall be used.

(3) Where conditions permit, panel and switch connections for wire of size No. 8 and larger shall be made with soldered copper lugs of adequate capacity.

(4) Make connection to all panels, switches, receptacles and fixtures, etc.; install finishing plates and make all systems complete and ready for use. Where fuses are employed, fill all fuse gaps with proper sized fuses and furnish a complete duplicate set of all fuses for spares. Where fuses are employed in dwelling unit circuit panels, they shall be of the non-tamperable type with properly coordinated adapters.

26-17. GROUNDING:

(1) In general, all wiring systems shall be grounded in accordance with the rules of Article 250 of the N.E. Code.

(2) Ground each building service entrance to a cold water pipe in the manner prescribed by the Code, with grounding clamps readily accessible. Provide other system and equipment grounds as conventionally required.

(3) Where non-metallic sheathed cables are used in conjunction with armored cables or wiring in metallic raceways, the grounding requirements are of special importance. Except in case of runs of less than 25 feet, metal raceways or enclosures must be grounded. Shorter runs are not required to be grounded if free from probable contact with a ground or grounded metal and are guarded against contact of persons with grounded surfaces. Particular attention shall be paid to the installation of wiring systems in kitchen and bathrooms.

26-18. INSTALLATION OF LIGHTING FIXTURES:

(1) Furnish, install and connect all lighting fixtures listed on the drawings and as detailed on Sheet E-2.

(2) The provision of lamps and their installation in fixtures located in dwellings is not required under this contract; however, the Contractor shall furnish and install incandescent lamps in all fixtures located in the M & M Building.

(3) All fixtures shall be properly polarized. (Connect shell of lampholder sockets to neutral (white) conductors.)

26-19. INSTALLATION OF TELEPHONE FACILITIES:

(1) Install empty raceways and telephone outlets as indicated on the plans. The installation of telephone instruments and wires will not be required.

(2) It is the intent of these specifications and the plans to provide for future entry of telephone lines into project buildings without the necessity of the Telephone Company drilling or cutting walls or partitions to effect entry of their wires and installation of instruments. Where telephone outlets are indicated on the plans, install at each such location an empty standard type switch box with a standard telephone flushmounted finishing plate. From outlet extend a roun of electrical metallic tubing, size 1/2", to building exterior wall and terminate tubing with a suitable bushing or fitting to eliminate possibility of wires being cut or damaged when pulled in.

26-20 ELECTRICAL CONNECTION OF EQUIPMENT:

(1) Overcurrent protection and disconnecting means shall be provided for all motor installations, as required by the codes.

(2) In general, all motor operated devices shall be fully connected and left ready for operation.

26-21. INSTALLATION OF ELECTRIC REFRIGERATORS:

(1) Electric refrigerators for all kitchenswill be separately purchased under another contract by the Authority.

(2) The refrigerator supplier will deliver all cabinets at the local transportation terminal. The Contractor for interior wiring shall then receive the equipment, uncrate, clean cabinets, remove packing debris, and place a refrigerator in its allocated position in each kitchen. Assemble all shelves in cabinets, and place trays and accessories therein.

(3) Each refrigerator cabinet shall be properly leveled, shipping bracing or blocking of parts removed, and then connected to the adjacent receptacle source of current. Try out each referigator to see that it operates properly, then disconnect cord and leave ready for tenant usage. In the event that any refrigerator is found to be inoperative, report such fact to the responsible representative of the Contracting Authority.

26-22. INSTALLATION OF FORCED HOT AIR FURNACE:

(1) The forced hot air furnace in the M & M Building will be provided with an electrically operated gas valve and room thermostat, also a bonnet thermostat to control the fan motor, all as specified under the HEATING DIVISION of the Specifications. Under this division these items shall be wired to and the thermostat installed, all in accordance with the directions of the manufacturer. Furnish a manual thermal overload disconnect switch of proper size for fan motor.

26-23 INSPECTION AND TESTS:

(1) Following completion of all wiring installations, test the individual systems, and eliminate any existing grounding of potential conductors, short circuits, other faults, etc. At the time of testing, all feeders, branches, panels and outlets shall be connected and the wiring systems complete from points of service connection. Test insulation resistance of systems.

(2) Insulation resistance shall meet the requirements of Rule 1119 of the N.E. Code. Provide suitable equipment and devices for making tests in the presence of the authorized representative of the Contracting Authority.